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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) See reverse side.		

20.

This report is a summary of information collected from three separate oceanographic experiments, each with three moorings, whose objectives were to study the influence of topography on low-frequency motions. Two arrays were set near Bermuda and one in the Charlie-Gibbs Fracture Zone (53°N, 34°W).

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WHOI-81-68

A COMPILATION OF MOORED CURRENT-METER DATA FROM THREE TOPOGRAPHIC EXPERIMENTS: THE BERMUDA MICROSTRUCTURE ARRAY, THE ISLAND TRAPPED WAVES ARRAY AND THE GIBBS FRACTURE ZONE ARRAY
VOLUME XXVII

by

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August 1981

TECHNICAL REPORT

Prepared for the Office of Naval Research under Contracts N00014-C-0262; NR 083-004 and N00014-76-C-0197; NR 083-400.

Approved for Distribution:

Valentine Worthington, Chairman
Department of Physical Oceanography

ABSTRACT

This report is a summary of information collected from three separate oceanographic experiments, each with three moorings, whose objectives were to study the influence of topography on low-frequency motions. Two arrays were set near Bermuda and one in the Charlie-Gibbs Fracture Zone (53°N, 34°W).

All the moorings were recovered after nine or thirteen months at sea. Temperature and current velocity data are displayed graphically as time series plots, histograms and spectra. Progressive vector plots and pressure time series are also presented. The data are summarized in statistical tables.

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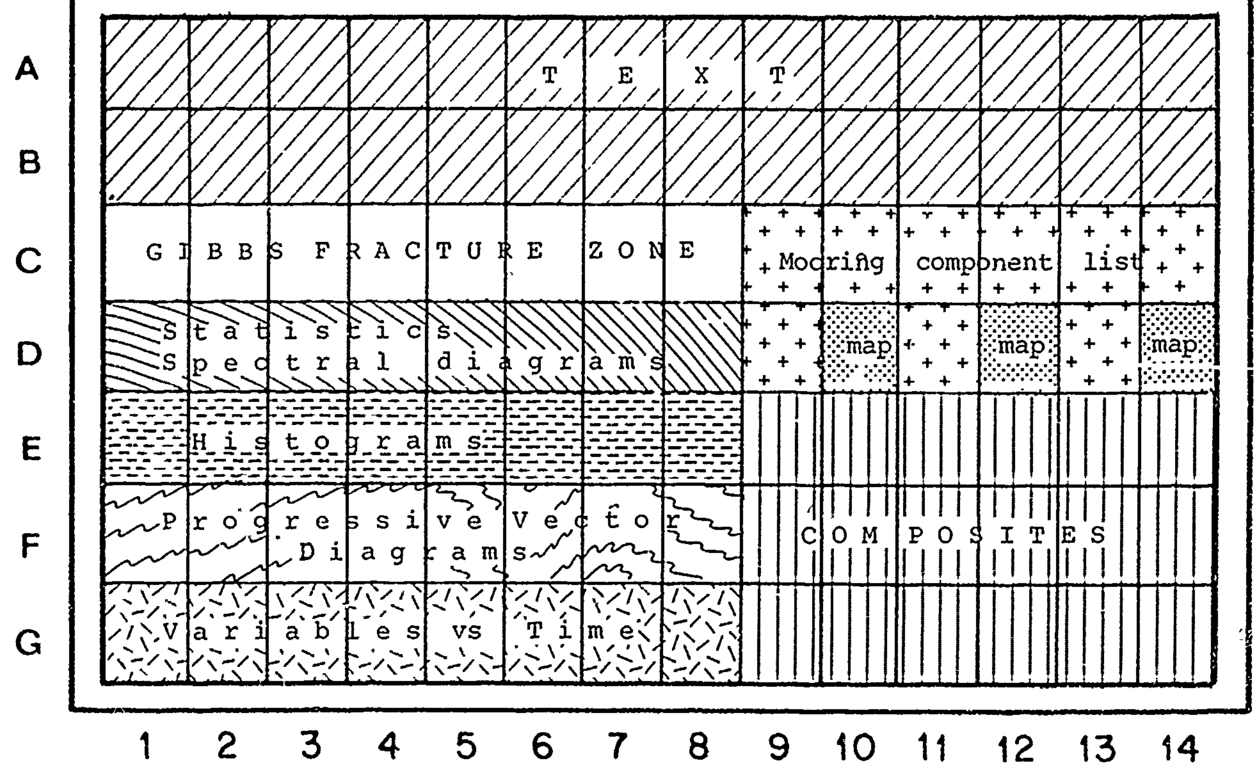

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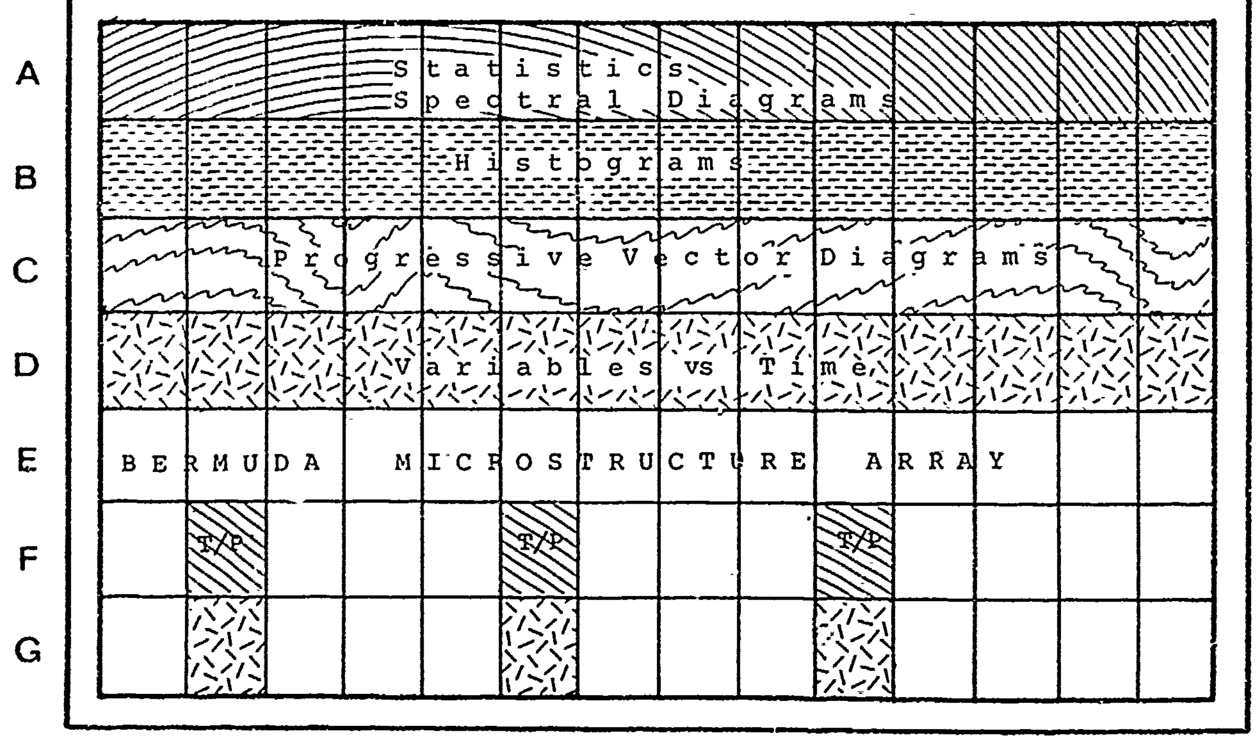

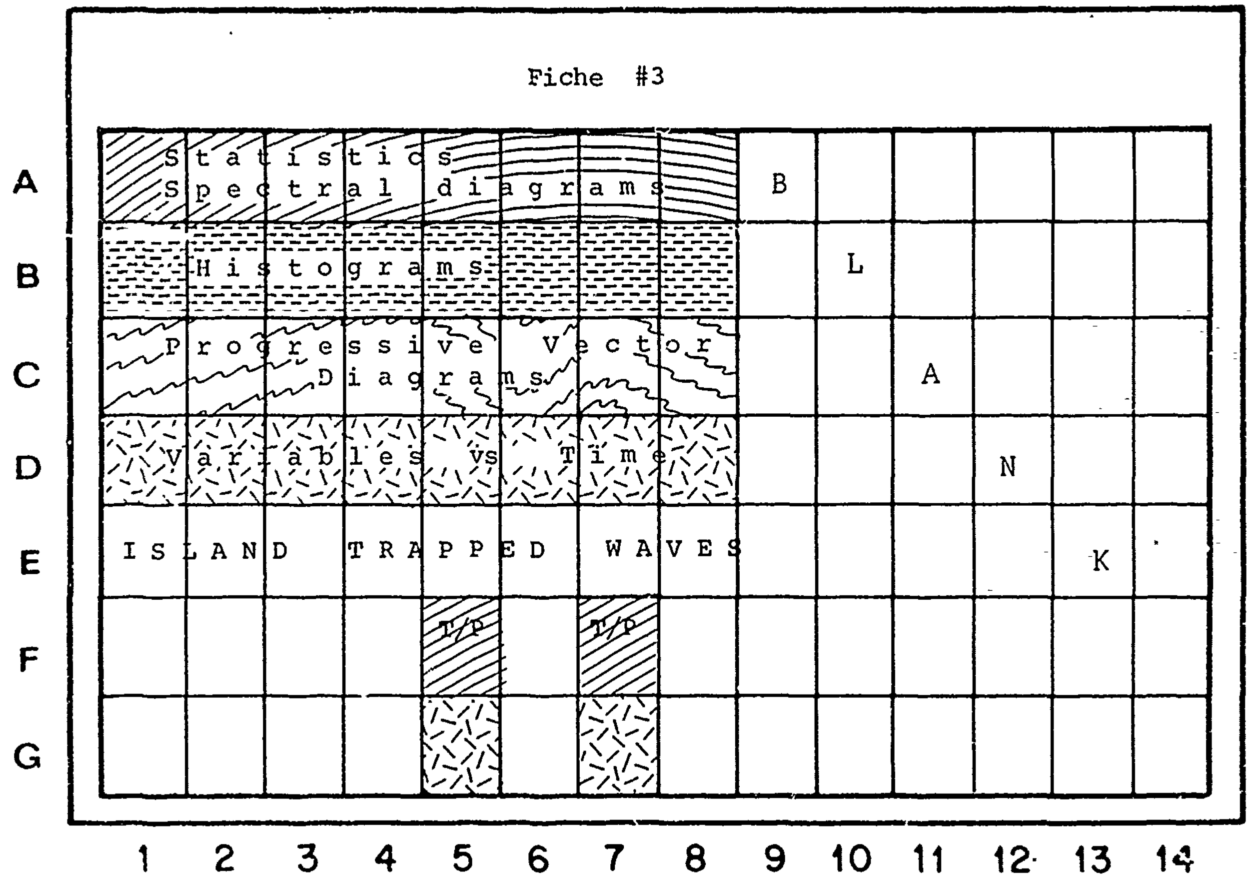

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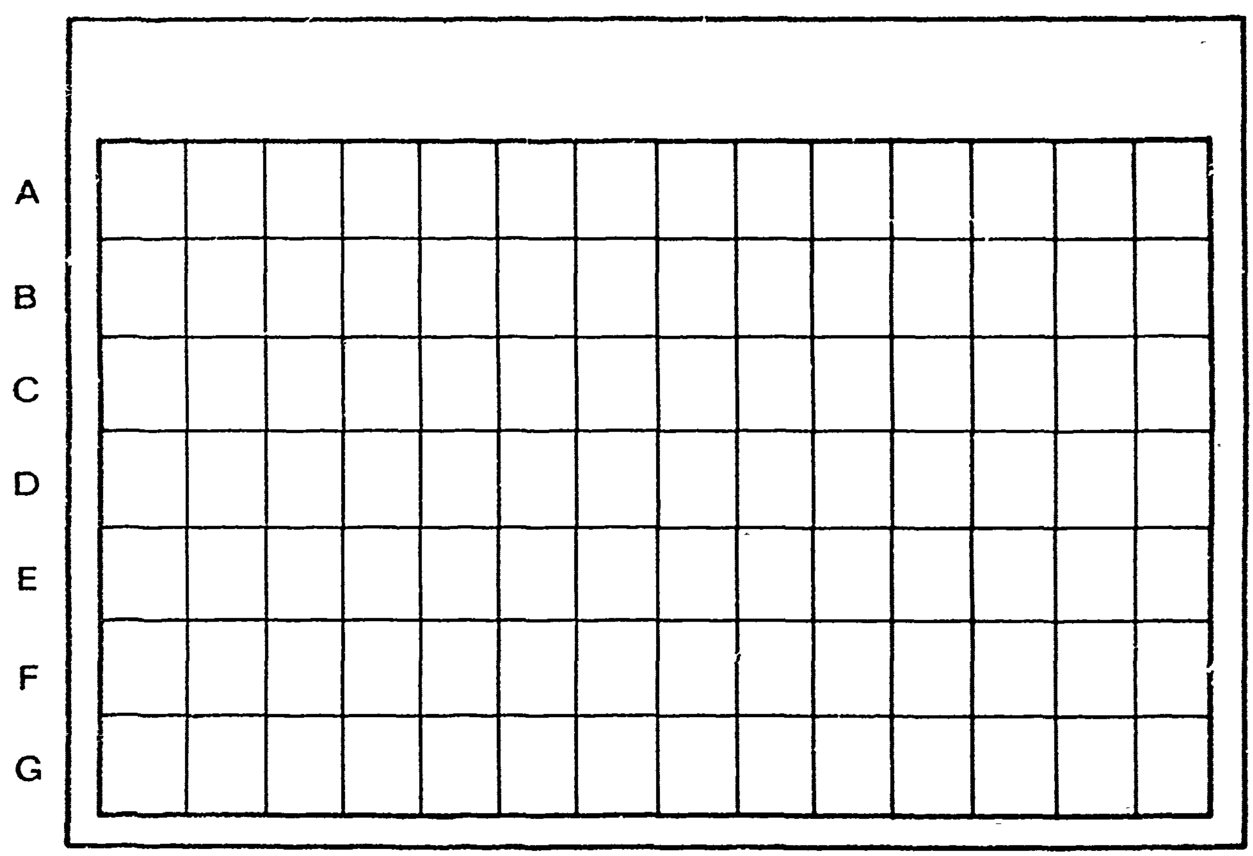

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ACKNOWLEDGMENTS

The authors wish to acknowledge the moored array group's operations personnel for their work of organizing, deploying and recovering the instruments. They also would like to acknowledge the crews of the various ships involved in the work, with special mention of the effort of the people involved in the trip of the R/V Panulirus to pick up a mooring which had broken loose.

Data processors Ellen Levy, Ann Spencer and Susan Tarbell provided extensive help with the plots and layout of the report.

Acknowledgments are also due to the Office of Naval Research for its support. The work was performed under contract numbers N00014-74-C-0262, NR083-004 and N00014-76-C-0197, NR083-400.

PREFACE

This volume is the twenty-seventh in a series of Data Reports presenting moored current meter and associated data collected by the WHOI Buoy Group.

Volumes I through XXVI present data obtained during the years 1963-1978, arranged either by year or experiment (see notes).

A data directory and bibliography for the years 1963-1978 has been published, as WHOI Technical Report 79-88.

Volume XXVII presents data from the Bermuda Microstructure experiment, the Island Trapped Waves array and the Charlie-Gibbs Fracture Zone array.

Volume No.	WHOI Ref. No.		Notes Year Experiment
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XXIII	80-40	Tarbell, S. and R. Payne.	1978 POLYMODE Array III
XXIV	80-41	Spencer, A., K. O'Neill and J. R. Luyten.	INDEX 1976
XXV	81-12	Spencer, A., E. D'Asaro and L. Armi.	BBL 1977
XXVI	81-45	Chausse, D. and R. E. Payne.	1972 measurements

PRESENTATION

The printed portion of this report contains introductory text and information about the instruments and data processing procedures. Tables and figures give summaries of the location of the instruments. Data are shown graphically in numerous composite displays.

The microfiche pages contain displays of the basic data. The data from the Gibbs Fracture Zone are shown on fiche 1, together with reproduction of the printed pages. Fiche 2 contains data from the Bermuda Microstructure experiment. Data from the Island Trapped Waves experiment are shown on fiche 3. The displays for the basic current meter data include spectral plots, tables of statistics, time series plots, progressive vector diagrams and frequency histograms. Time series plots, spectral plots and tables of statistics are shown for data from temperature/pressure recorders.

A detailed layout of the data on the microfiche sheets is shown on pages iii and iv.

INTRODUCTION

This report is a summary of information collected from three separate moored arrays, of nine or thirteen months duration. One array was deployed in the Charlie-Gibbs Fracture Zone to measure the mean flow and study the properties of the eddy field. The other two were deployed near Bermuda, one relatively far from the island and one close to the island. The objectives of the Bermuda experiment were to monitor low frequency motions during a shipboard investigation of microstructure near the island and to study low-frequency baroclinic waves trapped by the island.

Three moorings were set in September 1975 in the Charlie-Gibbs Fracture Zone, a deep east-west channel through the Mid-Atlantic ridge at 53° north (see Figure 1 and Table 1). Objectives were to measure the mean flow and investigate the properties of the mesoscale eddy field at this latitude and their interaction with the underlying topography. Results are reported in Schmitz and Hogg (1978) and Hogg and Schmitz (1980). The moorings were recovered in June 1976, giving 7 nine-month records. Data return is summarized in Table 2.

The first Bermuda array was set in April, 1975, in approximately an equilateral triangle configuration with 100 km sides and Bermuda at the center (see Figure 2 and Table 1). It was designed to monitor the background mesoscale eddy field during an intensive investigation of possible microstructure generation processes near the island (as a part of FAME, the north Atlantic Fine and Microstructure Experiment, Sanford and Hogg, 1977). The mooring and related hydrographic results are described in Hogg, Katz and Sanford (1978). The array was recovered in January, 1976, giving records of up to 9 months duration. Instrument performance is summarized in Table 3.

In these current meter records, there were suggestions of coherent motions (trapped waves) travelling clockwise around Bermuda. This prompted the setting of the second array (the "Island Trapped Waves" experiment) in November 1977 (see Figure 3 and Table 1) which was designed to be in the near field of the trapped wave motions. Results from this experiment have been reported by Hogg (1980). The array was recovered in December, 1978 after more than a years deployment, although one mooring released prematurely two weeks earlier and was found by a local fisherman. Data return is summarized in Table 4.

INSTRUMENTATION

Current Meters

The current meters described in this report were Vector Averaging Current Meters (VACMs), built by AMF SeaLink Systems (now EG&G SeaLink Systems), or Model 850 current meters built by Geodyne, now a part of EG&G.

Each time a pair of rotor magnets passes the sensing diode, the VACM samples compass and vane information and computes a measure of east and north water current components. These components are summed through the entire recording interval, usually 15 minutes, thus giving a true vector average. One complete rotor revolution initiates 8 compute cycles. Temperature is derived from a voltage-to-frequency converter (v/f), whose output frequency is related to the thermistor resistance at its input. The v/f output pulses are summed over the entire recording interval, thus averaging temperature. The thermistors are routinely calibrated before and after deployment and the temperatures are accurate to $\pm .01\,^{\circ}C$ (Payne et al., 1976). All variables are recorded on a cassette tape at the end of each recording interval.

The Model 850 current meter stores burst sampled data on magnetic tape cartridges. The instrument collects and stores 23 or 24 data cycles sampled at 5.27 second intervals. It then turns off for the remainder of the recording interval (usually 15 or 30 minutes). Model 850's, which have been modified to include temperature measurements, accumulate the count from the temperature circuit from one 5.19 second period and record it at the beginning of each data burst.

Time was measured using a quartz crystal oscillator with a manufacturer's specified accuracy of ± 1 second per day. All stated times are in UTC (Universal Coordinated Time). The instrument clock times were synchronized with UTC before mooring launch. After recovery, differences in the two times were noted.

Two of the instruments (5532 and 5552) were modified to record differential temperature (tdif). A thermistor was mounted externally at each end of the VACM pressure case (a distance of 1.74 meters apart), and a differential resistance was measured and recorded. The lithium batteries in the instruments failed shortly after deployment, giving short records of all variables. See McCullough (1975) and Dean (1979) for further information.

One of the VACMs (6331) contained a pressure transducer, manufactured by Paine. It is a strain gauge with a rated accuracy of .05 per cent of full scale. The instrument is routinely calibrated before deployment.

Temperature/Pressure Recorder

An instrument to record temperature, pressure and time (T/P) was developed in the Draper Laboratory at MIT for MODE-1 and has been used extensively since 1973. The instrument stores a sample every 15 seconds and records the sum of 128 successive data samples every 32 minutes on a magnetic tape cassette (128 x 15 = 1920 seconds = 32 minutes).

Temperatures have a resolution of .001°C (Wunsch and Dahlen, 1974). The absolute accuracy is not specified.

The pressure sensor is a strain gauge with a manufacturer-specified accuracy of .03 per cent of full scale (Wunsch and Dahlen, 1974). These sensors are recalibrated for each instrument deployment.

MOORINGS

Details of the mooring configuration are shown in Tables 5-13. The items on each mooring are listed. Depths in meters and data names are included for data recording instruments.

The anchor was usually a cylinder weighing from 2000-2700 pounds (wet weight). In the Gibbs Fracture Zone, the anchor on the short mooring weighed 1000 pounds.

Items with the words "glass spheres" refer to glass flotation spheres of 16" or 17" diameter with hard hats, each one bolted to 3/8" chain at 1 meter intervals.

Milliman samples are corrosion measuring devices, attached to the mooring wire.

Figures 1 through 3 show mooring locations and Tables 1 through 4 give summaries of the instruments, their depths and the quality of the data.

See Heinmiller (1976) for a more complete description of WHOI moorings.

DATA PROCESSING

Current Meters

The data from the instrument tapes were transcribed to 9-track magnetic tapes, converted to scientific units, edited to remove launch and retrieval transients and bad points, and linearly interpolated across missing or erroneous data cycles.

WHOI data are identified by a mooring number, a sequential instrument position number (e.g., 5713 is the third instrument down on mooring 571), a letter to indicate the data version (e.g., 5713B is the second editing of 5713), and a number to indicate the time sampling interval for that data record (e.g., 5713B1800 is the half-hour (1800 seconds) averaged version).

Low-passed versions of data series were formed by passing the data through a Gaussian filter with a 24 hour half-width, and then subsampling the filtered series once a day. The composite plots shown for each mooring and the time series plots and progressive vector plots on the microfiche use these low-passed data files.

Temperature/Pressure Recorders

Cassette reading and preliminary data processing were carried out at MIT. The basic time series received by WHOI had been truncated to remove launch and retrieval transients, but detailed editing was done at WHOI. Basic spectral plots, time series and statistics are shown for the T/Ps, and the low-passed temperature data are shown on the composite temperature plots for each mooring.

PROGRAMS

Time Series Plots

Current meter and T/P variables versus time are presented graphically. All the plots are based on low-passed time series.

Statistics

Statistics for each variable measured by the current meters and T/P's are presented on microfiche. Mean, standard error, variance, kurtosis and extrema are given for all the variables; east and north covariance, correlation and other statistics are given for the vectors. The data series used is based on the instrument sampling interval. For reference, note that a Gaussian random variable would have a kurtosis of three and a skewness of zero.

See Tarbell, Spencer and Payne, (1978) for a more detailed discussion of these parameters.

Progressive Vector Plots

Based on a low-passed time series, the current vectors are placed tail-to-head so as to show the path that a perfect particle in a perfectly homogeneous flow would have travelled. Flow regimes and low frequency behavior show up well on this type of plot. The plot begins with an asterisk and the first day of each month is marked with a plus sign and every 5th month is annotated.

Vector Stick Plots

The 24-hour averaged current components are plotted as individual vectors along a time scale. Unless otherwise indicated, the vector orientation is such that north is upwards on the page.

The vector roses show current vectors sampled every 7 days, plotted at the location of the mooring.

Histograms

The variables temperature, speed and direction are shown as frequency of occurence versus amplitude plots. The mean for each data series is marked.

Spectra

The horizontal kinetic energy (HKE) and temperature are displayed as spectra. The HKE spectrum is half of the sum of the spectra of the east and north components. It has the advantage of not being tied to a particular coordinate system.

The HKE and temperature have units of (cm^2/sec^2)/cph and $(°C)^2$/cph respectively. The spectra are all one-sided, i.e., the area under the spectrum is equal to the variance of the original record. The plots are log-log rather than 'variance preserving', i.e., the contributions of various frequency bands to the total variance are not in proportion to the displayed areas.

The spectra are calculated based on data sequences of 3240 or 4000 points ('pieces'). Frequency band averaging is across three frequencies and no data-windowing or prewhitening is done.

The WHOI spectral program TIMSAN (Hunt, 1977) averages the spectra in increasingly large groups at the high frequencies to prevent having to plot thousands of points. This procedure gives few degrees of freedom (d.o.f) at the low frequencies, and many at the high frequencies. For the spectra calculated from one piece with three frequencies averaged there are 6 d.o.f. in the lowest frequency group, and 600 d.o.f. in the highest frequency group.

REFERENCES

Dean, J. P., 1979, A Moored Instrument for Vertical Temperature Gradients. J. Geophys. Res. 84, 5089-5091.

Heinmiller, R. H., 1976, Woods Hole Buoy Project Moorings, 1960-1974. WHOI Ref. 76-53 (Technical Report).

Hogg, N. G., 1980. Observations of internal Kelvin Waves trapped round Bermuda. J. Phys. Ocean. 10, 1353-1376

Hogg, N. G., E. J. Katz and T. B. Sanford, 1978. Eddies Islands and Mixing. J. Geophys. Res. 83, 2921-2938.

Hogg, N. G. and W. J. Schmitz,Jr.,1980. A dynamical interpretation of low frequency motions near very rough topography - the Charlie-Gibbs Fracture Zone. J. Mar. Res. 38, 215-248.

Hunt, M., 1977, A program for spectral analysis of time series. WHOI Technical Memorandum 2-77.

McCullough, J. R., 1975, Vector Averaging current meter speed calibration and recording technique. WHOI Ref. 75-44 (Technical Report.)

Payne, R. E., A. L. Bradshaw, J. P. Dean and K. E. Schleicher, 1976, Accuracy of temperature measurements with the V.A.C.M. WHOI Ref. 76-94 (Technical Report).

Sanford, T.,B. and N. G. Hogg, 1977. The North Atlantic fine and microstructure cruise, Knorr 52 and Eastward 75-12. WHOI Ref. 77-11. (Technical Report)

Schmitz, W. J. Jr. and N. G. Hogg, 1978. Observations of energetic low frequency current fluctuations in the Charlie-Gibbs Fracture Zone. J. Mar. Res. 36, 725-734.

Tarbell, S., A. Spencer and R. E. Payne, 1978. A compilation of moored current meter data and associated oceanographic observations. Vol XVII (POLYMODE Array II data). WHOI Ref. 78-49 (Technical Report).

Wunsch, C., and J. Dahlen, 1974, A moored temperature and pressure recorder. Deep-Sea Res., 21, 145-154.

TABLE CAPTIONS

FIGURE CAPTIONS

Figs. 7-21

Orientation of vectors is as noted on plots. Scales are in cm/sec (not mm/sec as noted in fiche).

TABLE 1

SUMMARY OF MOORINGS

Mooring No.	No. of instruments	Date Set	Date Retr.	Location	Bottom Depth (m)
		CHARLIE-GIBBS FRACTURE ZONE ...Cruise...			
		Knorr 51	Knorr 54 Leg 7		
570	1	Sep. 26 1975	June 24 1976	52° 42.7'N 33° 59.2'W	4288
571	3	Sep. 27 1975	June 26 1976	52° 53.7'N 35° 31.0'W	2895
572	4	Sep. 27 1975	June 25 1976	52° 46.1'N 35° 30.0'W	3398
		BERMUDA MICROSTRUCTURE ARRAY ...Cruise...			
		Knorr 49	USCGC Evergreen		
553	5	Apr. 28 1975	Jan. 26 1976	31° 46.9'N 64° 25.2'W	4353
554	5	Apr. 29 1975	Jan. 26 1976	32° 21.5'N 65° 27.0'W	4774
555	7	Apr. 9 1975	Jan. 25 1976	32° 59.[illegible]'N 64° 23.8'W	4527
		ISLAND TRAPPED WAVES EXPERIMENT ...Cruise...			
		RV Erline	Oceanus 52 Leg III		
633	4	Nov. 15 1977	Dec. 7 * 1978	32° 33.8'N 64° 44.7'W	1611
634	3	Nov. 16 1977	Dec. 16 1978	32° 32.2'N 64° 44.1'W	942
635	3	Nov. 17 1977	Dec. 17 1978	32° 22.4'N 65° 0.9'W	924

* Recovered by R/V Panulirus.

TABLE 2

DATA RETURN AND QUALITY

RECORDS FROM CHARLIE-GIBBS FRACTURE ZONE

Record No.	Inst. depth (m)	Data Dates 1975 - 1976	No. of days	Data presented	Comments
5701	4227	Sep.27 - June 24	271	V T *	
5711	1007	Sep.28 - June 26	272	V T	
5712	2537	Sep 28 - Nov. 4/75	39	V T	Electronic problems
5713	2835	Sep 28 - June 26	272	V T	
5721	998	Sep.28 - June 25	271	V T	
5722	2528	Sep.28 - June 25	271	V T	
5723	3060	Sep.28 - June 25	271	V T	
5724	3360	Sep.28 - June 25	271	V T	

V Velocity component data presented
T Temperature " "

* There were 2 thermistors on this current meter. The records were virtually identical, only one series is displayed

TABLE 3

DATA RETURN AND QUALITY

RECORDS FROM BERMUDA MICROSTRUCTURE ARRAY

Record No.	Inst. depth (m)	Data Dates 1975 - 1976	[illegible] of [illegible]	Data presented	Comments
5531	306	Apr.29 - Jan.26	272	V T	
5532	506	Apr.29 - Oct.15/75	[illegible]	V T TD	Errors on sea tape
5533(T/P)	734	Apr.29 - Jan.26	[illegible]	T P	
5534	1005	Apr.29 - Jan.26	[illegible]	V T	
5535	1505	Apr.29 - Jan.26	272	V T *	Vane stuck after Sept.15 Rotor stuck after Dec. 1
5541	314	Apr.29 - Jan.26	271	V T	
5542	514	Apr.29 - Jan.26	271	V T	
5543(T/P)	718	Apr.29 - Aug.29/75	122	T P	Battery depleted
5544	1013	Apr.29 - Jan.26	271	V T	
5545	1513	Apr.29 - May 25/75	26	V T #	Vane stuck after May 26. Rotor below threshold after Oct. 19
5551	316	Apr.30 - Jan.25	270	V T	
5552	516	Apr.30 - Aug.12/75	104	V T TD	Battery leaked
5553(T/P)	752	Apr.29 - May 20/75	20	V T	Electronic problem
5554	766	Apr.29 - Nov.21/75	206	V T	Battery leaked
5555	1016	Apr.30 - Jan.25	270	V T	
5556	1516	Apr.30 - June 12/75	44	V T #	Corrosion in vane vane stuck after June 13
5557	4016	Apr.30 - Jan.25	270	V T	

All instruments were current meters except where noted (T/P)

V	Velocity component data presented
P	Pressure " "
T	Temperature " "
TD	Instrument also had differential temperature sensors
*	No data is presented for the basic velocity series Time series are shown for all low-passed data.
#	All data is presented for the stated interval. A questionable full-length series is used to show provecs and time series plots.

TABLE 4

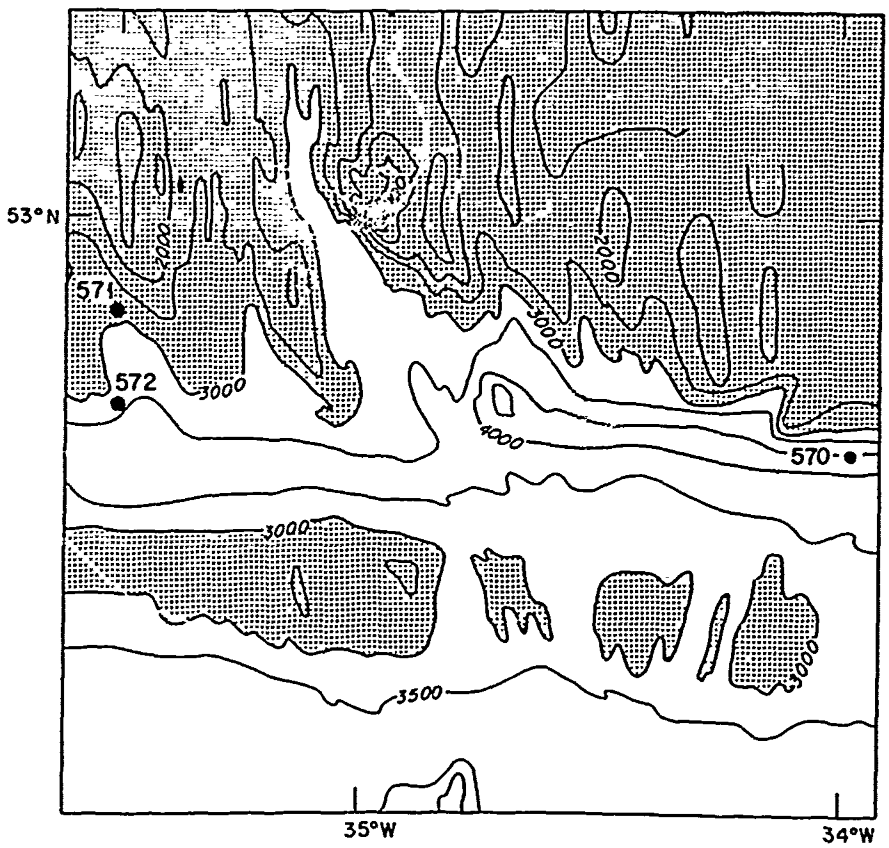
DATA RETURN AND QUALITY

RECORDS FROM ISLAND TRAPPED WAVES EXPERIMENT

Record No.	Inst. depth (m)	Data Dates 1977 - 1978	No. of days	Data presented	Comments
6331	792	Nov.16 - Dec.3	382	T P	Rotor did not work
6332	1092	Nov.16 - Dec.3	382	V T	
6333	1392	Nov.16 - Aug.18/77	275	V T	Clock problems
6334	1692	Nov.16 - Dec.3	382	V T	
6341(T/P)	242	Nov.16 - Dec.16	395	T P	
6342	542	Nov.16 - Dec.16	395	V T	
6343	842	Nov.16 - Dec.16	395	V T	
6351(T/P)	224	Nov.17 - Dec.16	394	T P	
6352	524	Nov.17 - Dec.16	394	V T	
6353	824	Nov.17 - Dec.16	394	T	No rotor data on cassette

All instruments were current meters except where noted (T/P)

V Velocity component data presented
P Pressure " "
T Temperature " "



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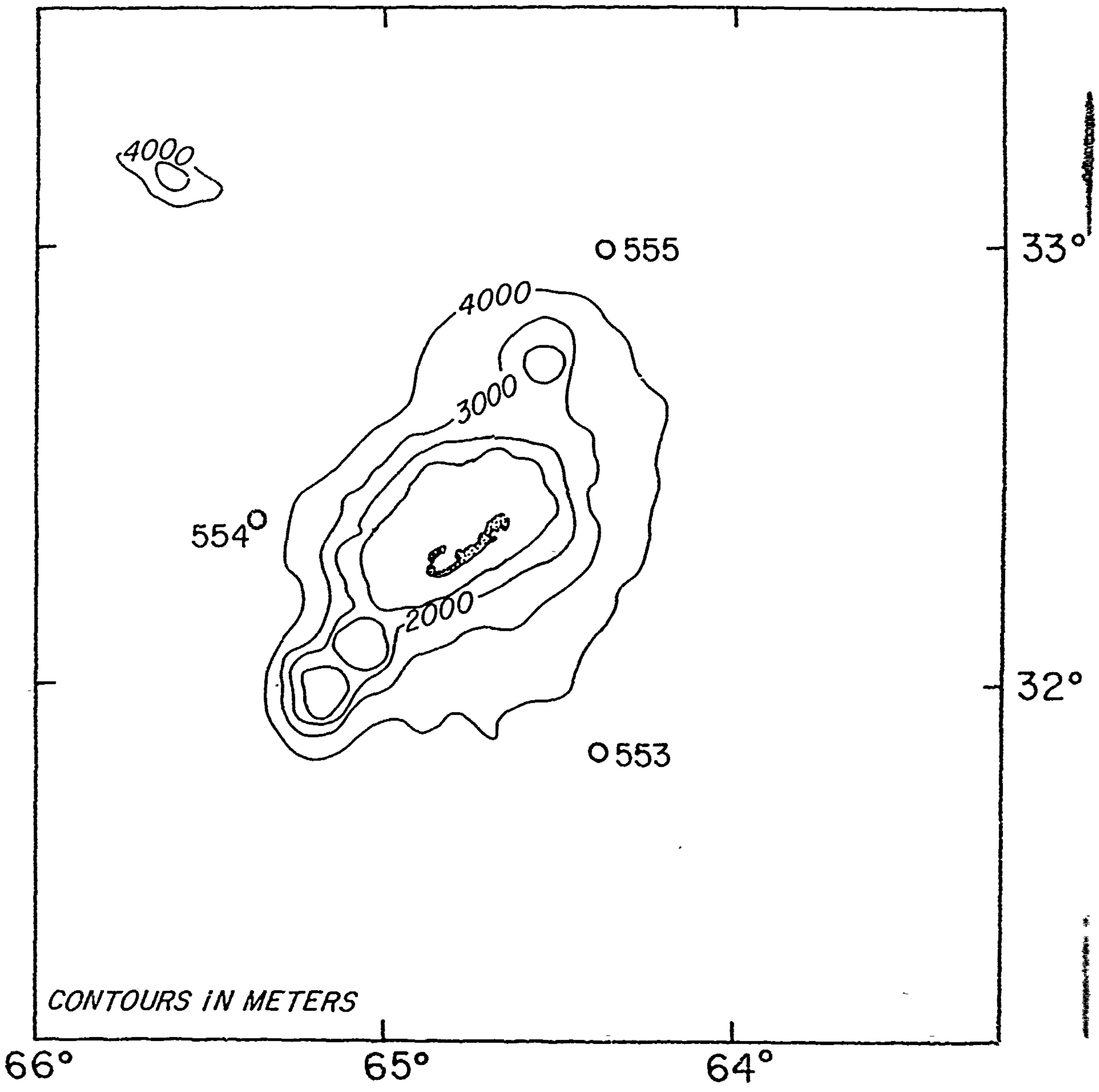
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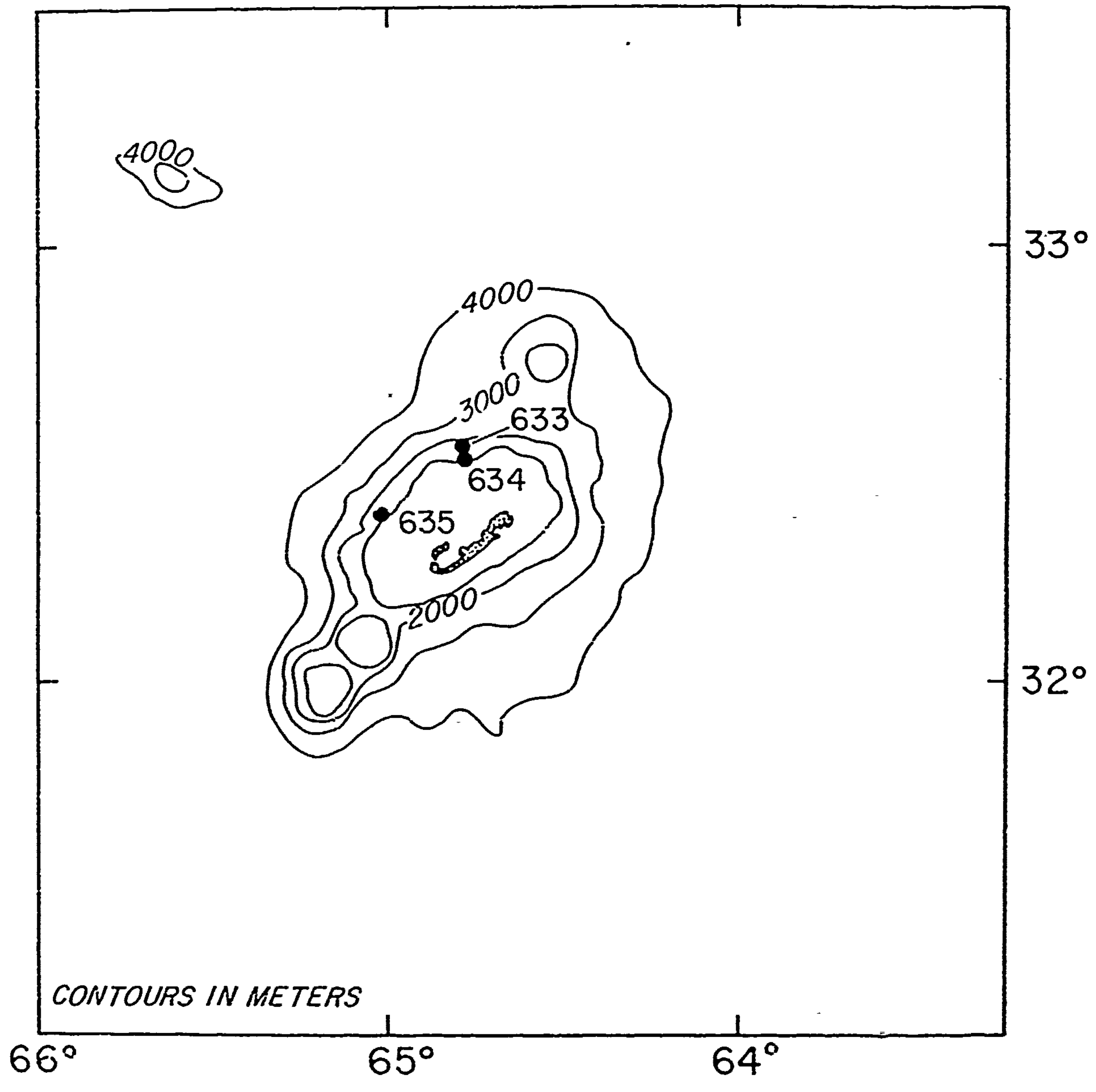
O 555
33°
4000
3000
554O
2000
32°
O 553
CONTOURS IN METERS
66°
65°
64°

Figure 2


4000
33°
4000
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633
634
635
2000
32°
CONTOURS IN METERS
66°
65°
64°

Figure 3

CURRENT ROSES FOR NEAR BOTTOM INSTRUMENTS

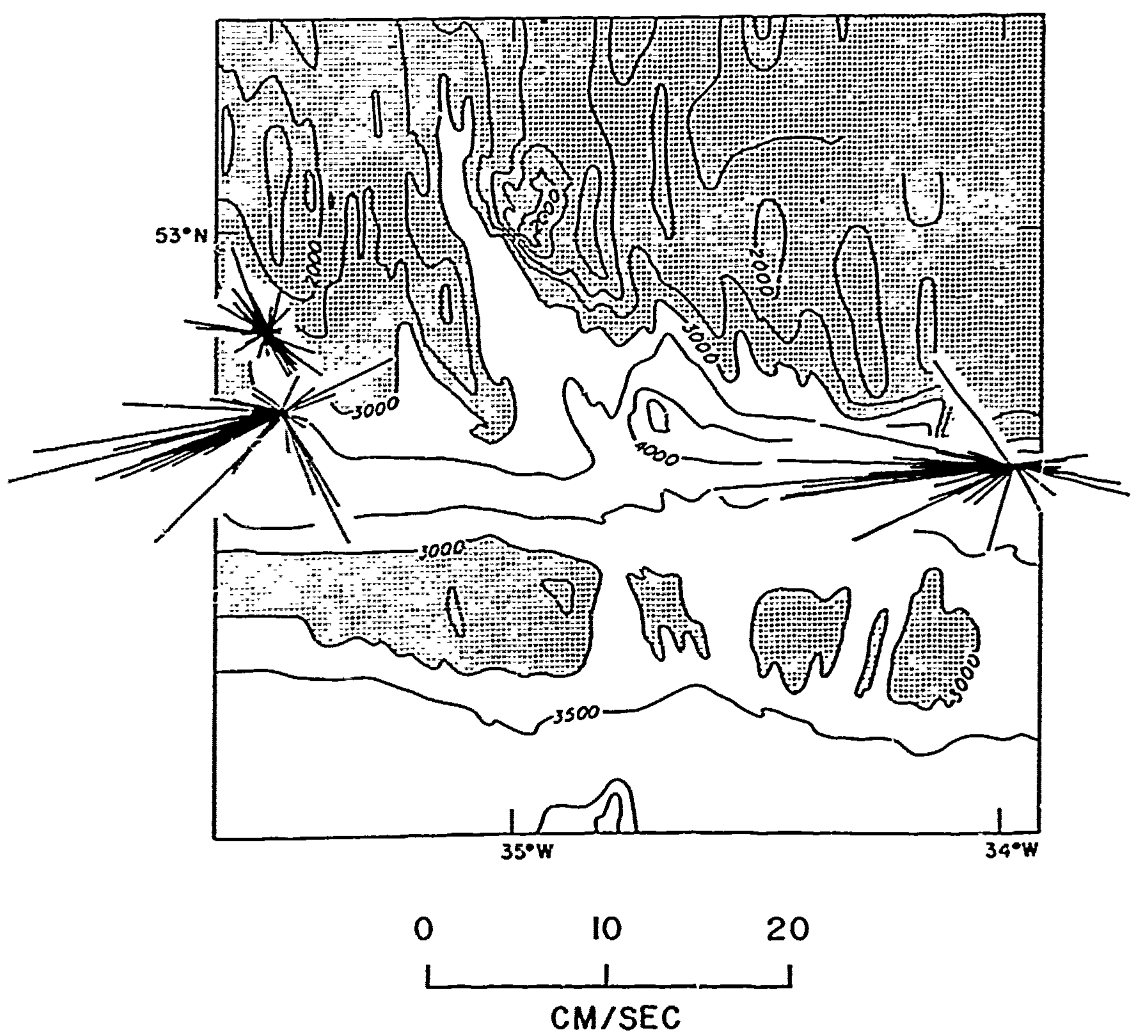


Figure 4

CURRENT ROSES AT A NOMINAL DEPTH OF 1500 M

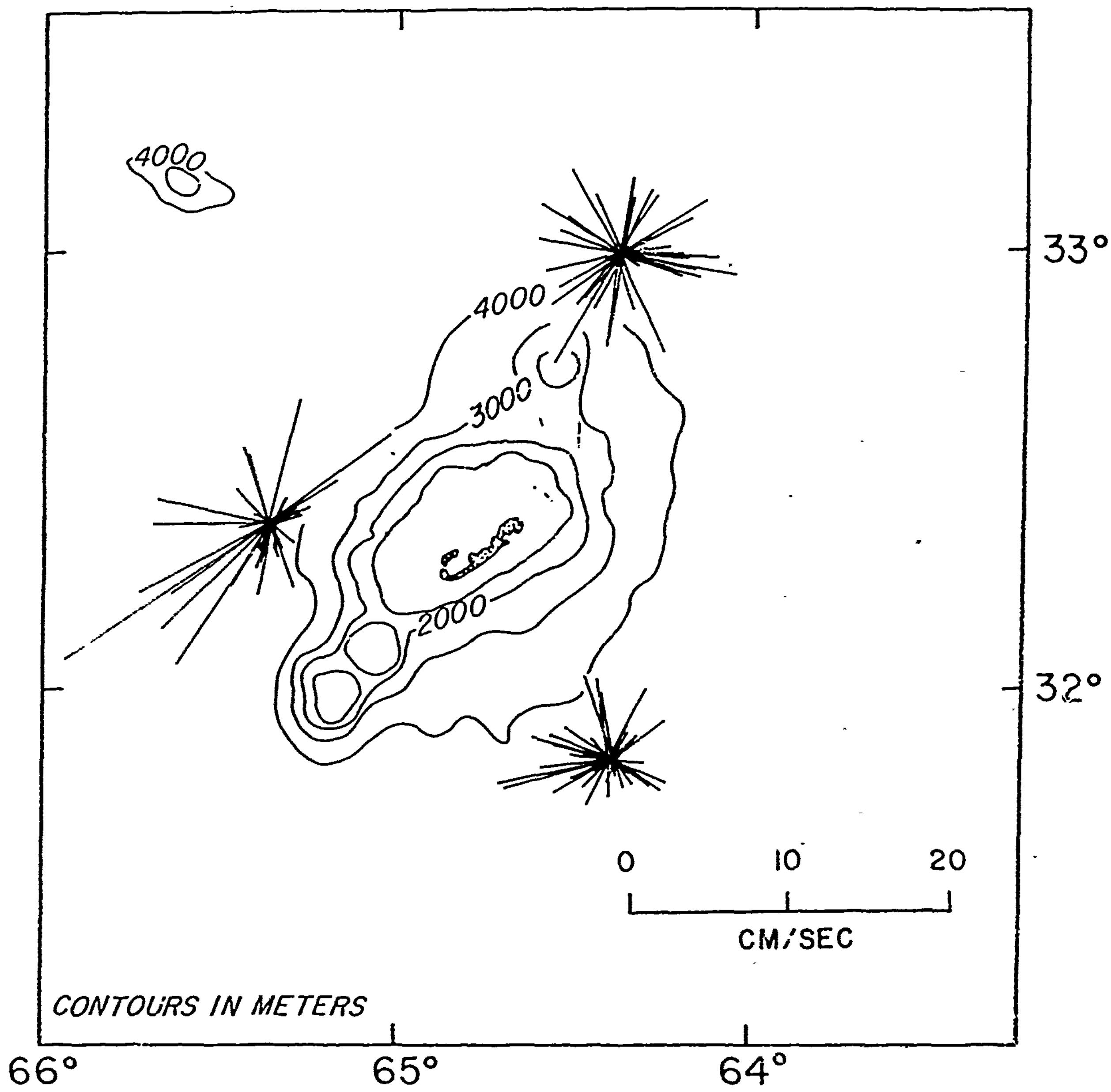


Figure 5

CURRENT ROSES AT A NOMINAL DEPTH OF 500 M

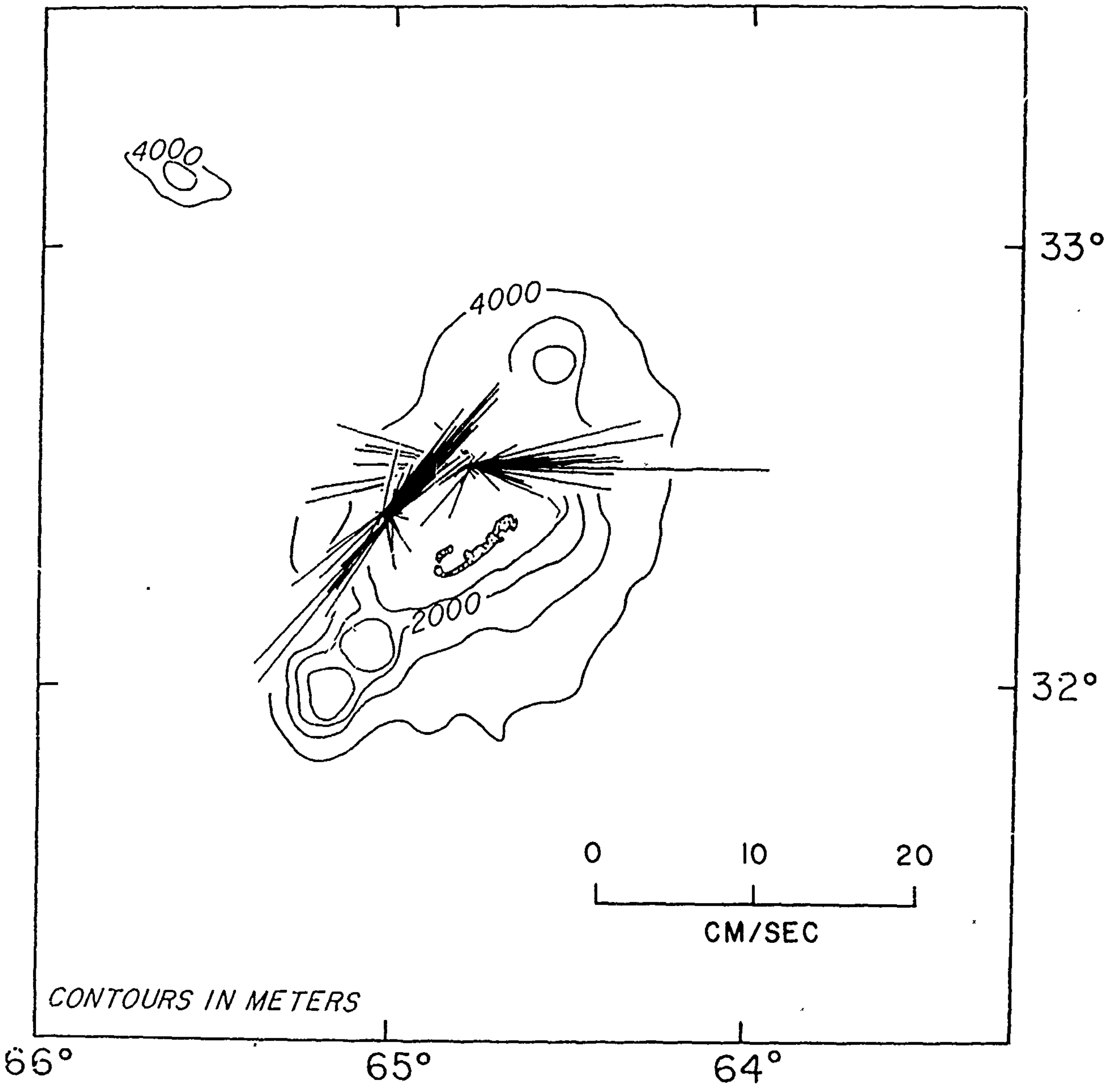


Figure 6

CURRENT VECTOR FOR MOORING 570

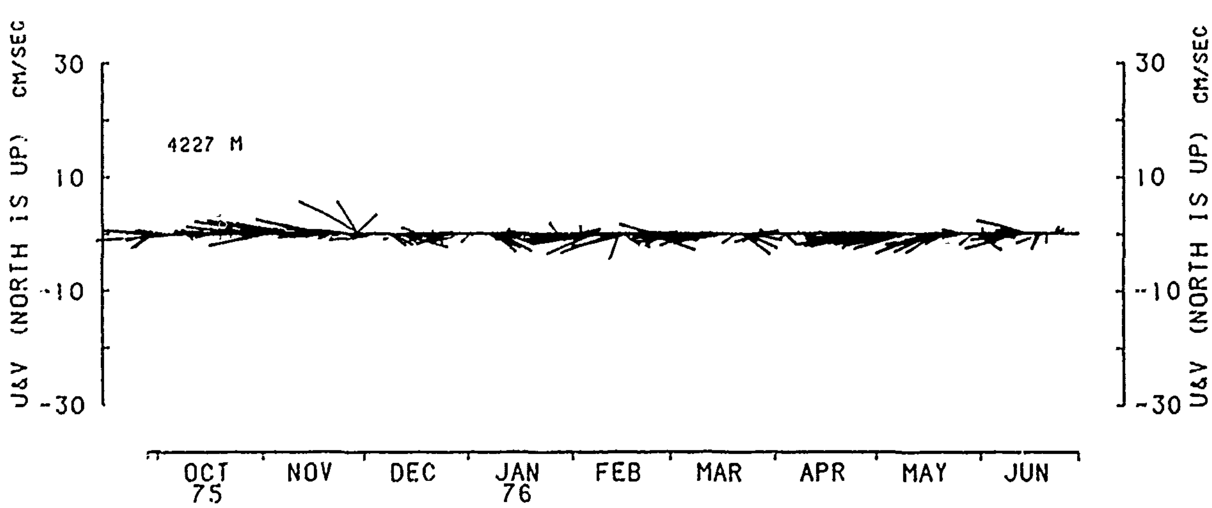


Figure 7

TEMPERATURE RECORD MOORING 570

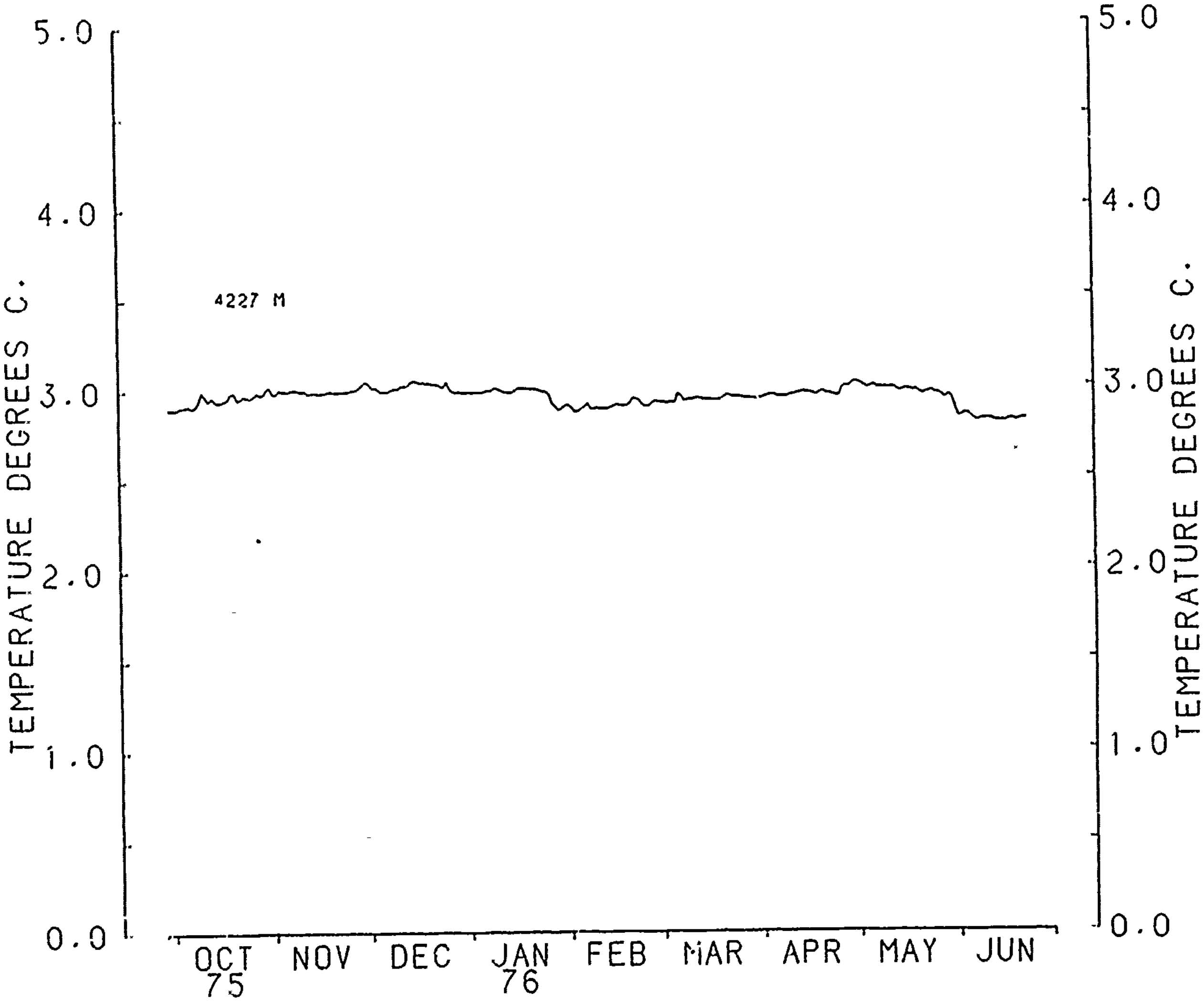


Figure 10

CURRENT VECTORS FOR MOORING 571

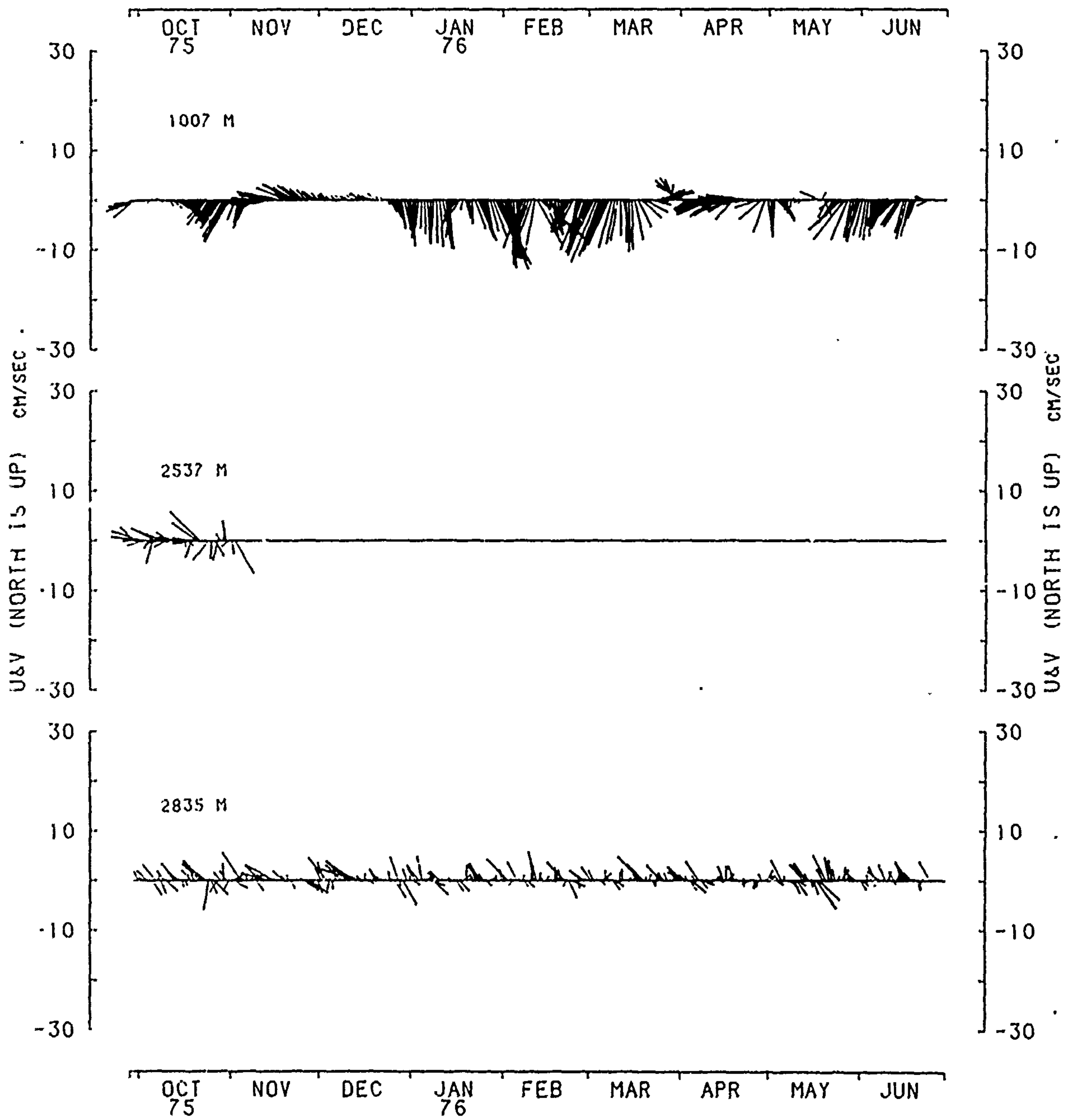


Figure 8

TEMPERATURE RECORDS MOORING 571

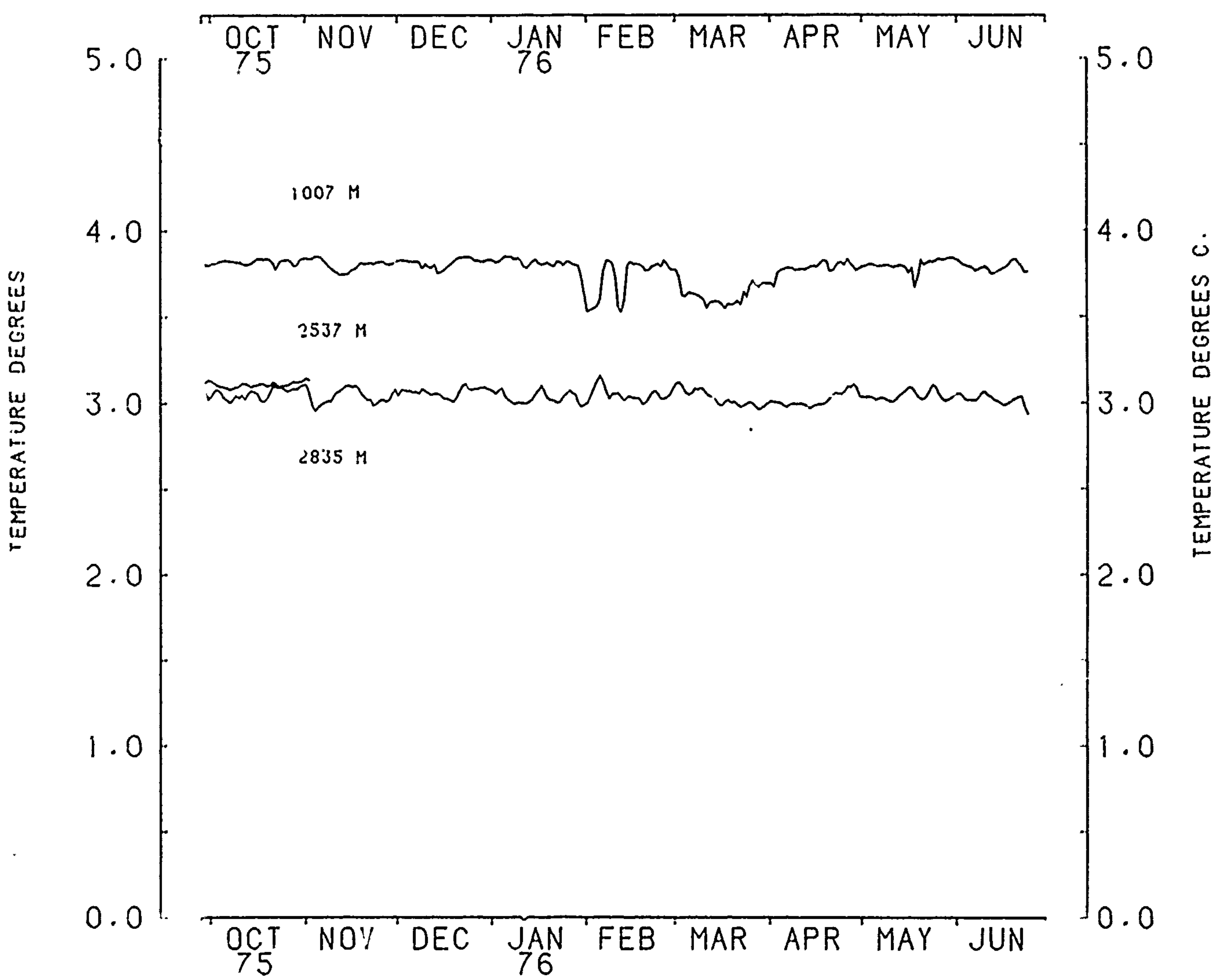


Figure 11

CURRENT VECTORS FOR MOORING 572

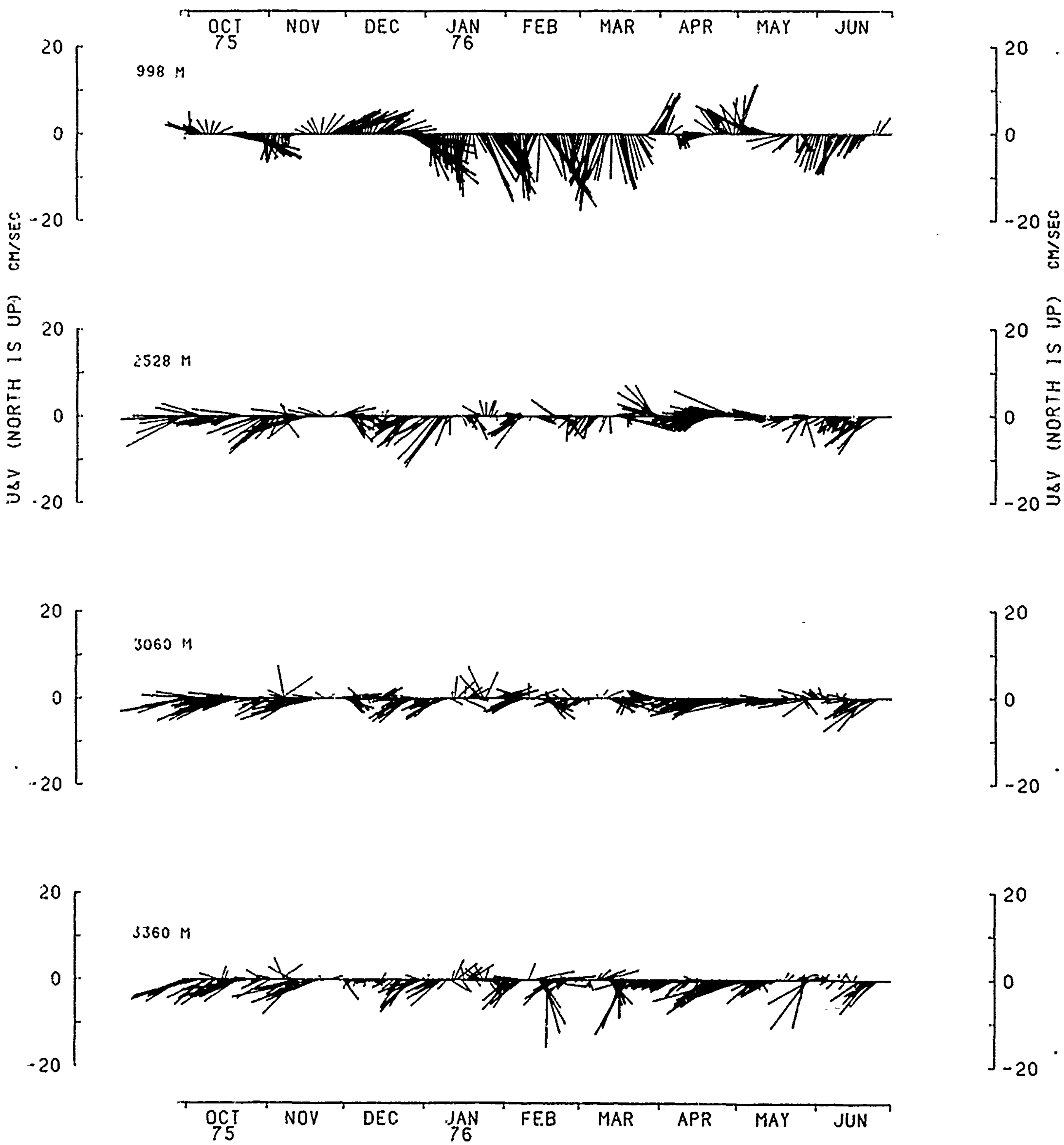


Figure 9

TEMPERATURE RECORDS MOORING 572

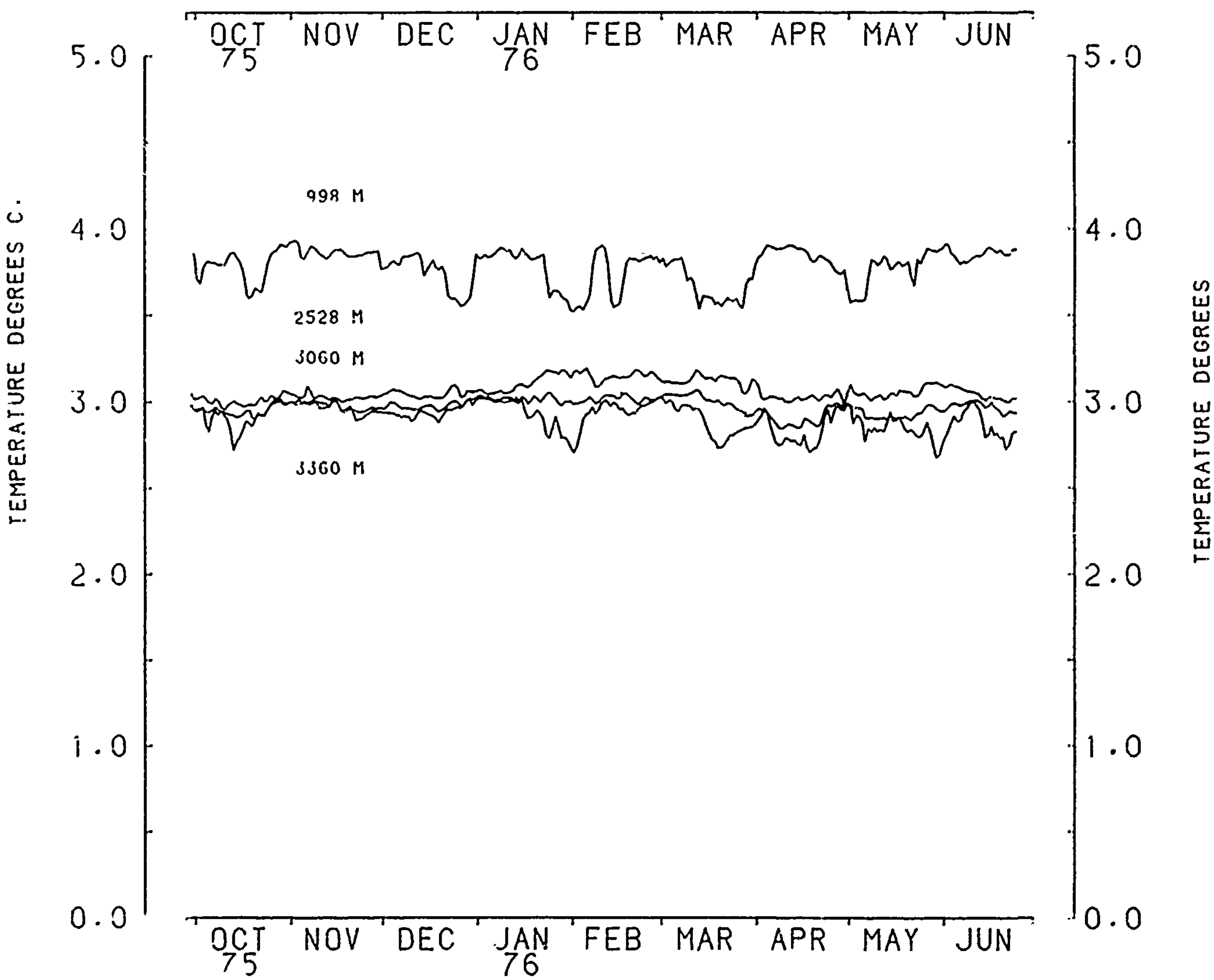
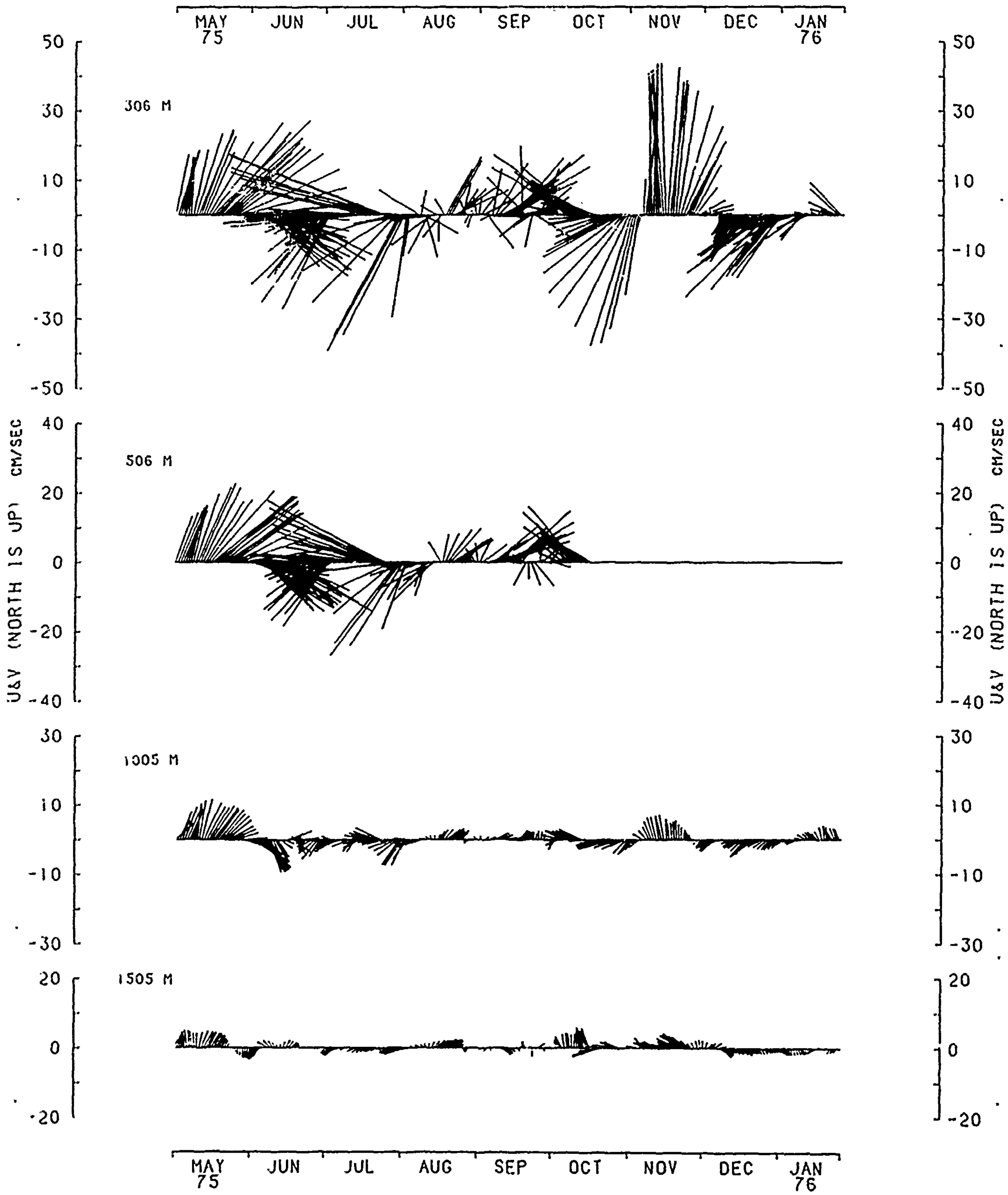


Figure 12

CURRENT VECTORS FOR MOORING 553



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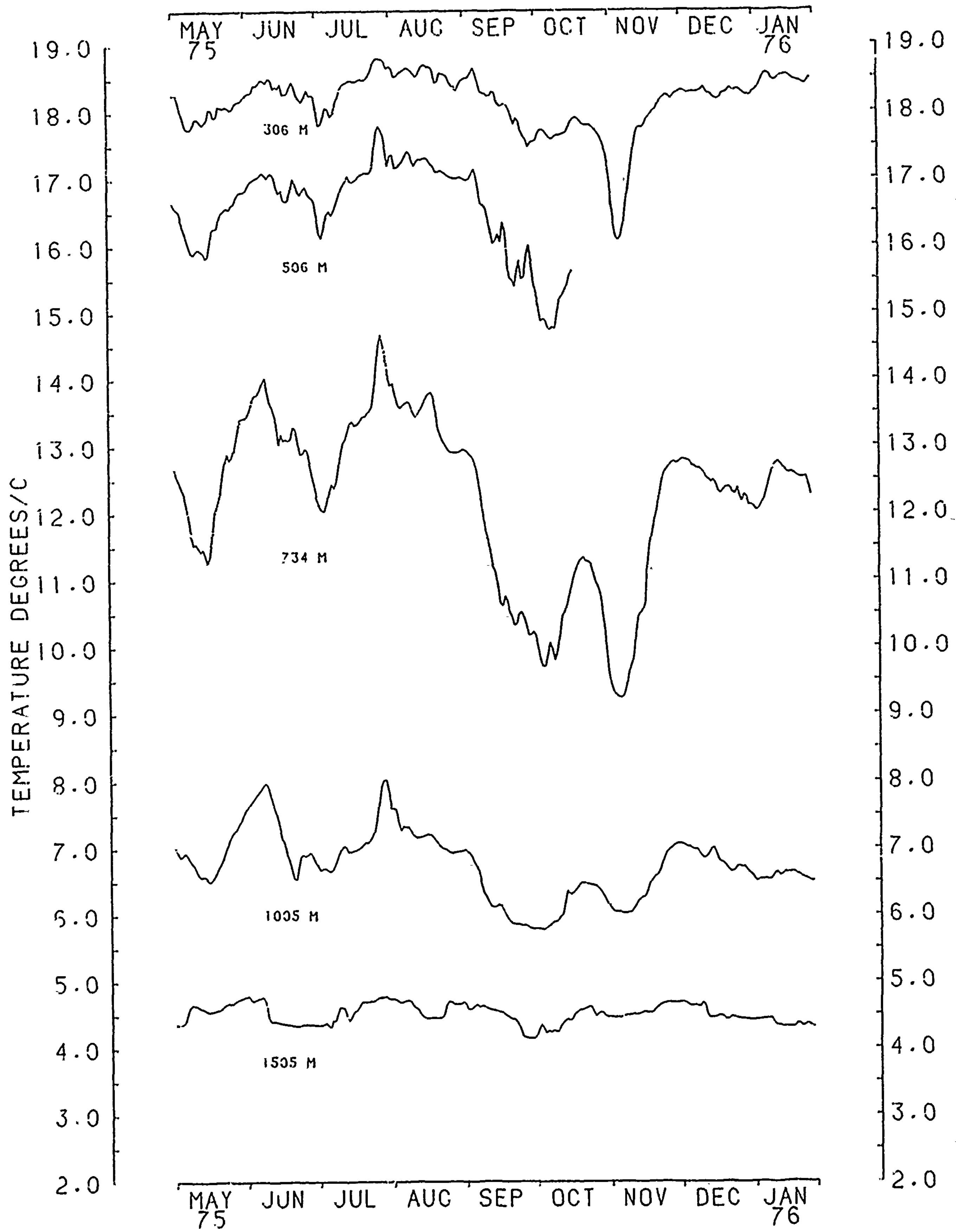
TEMPERATURE RECORDS MOORING 553



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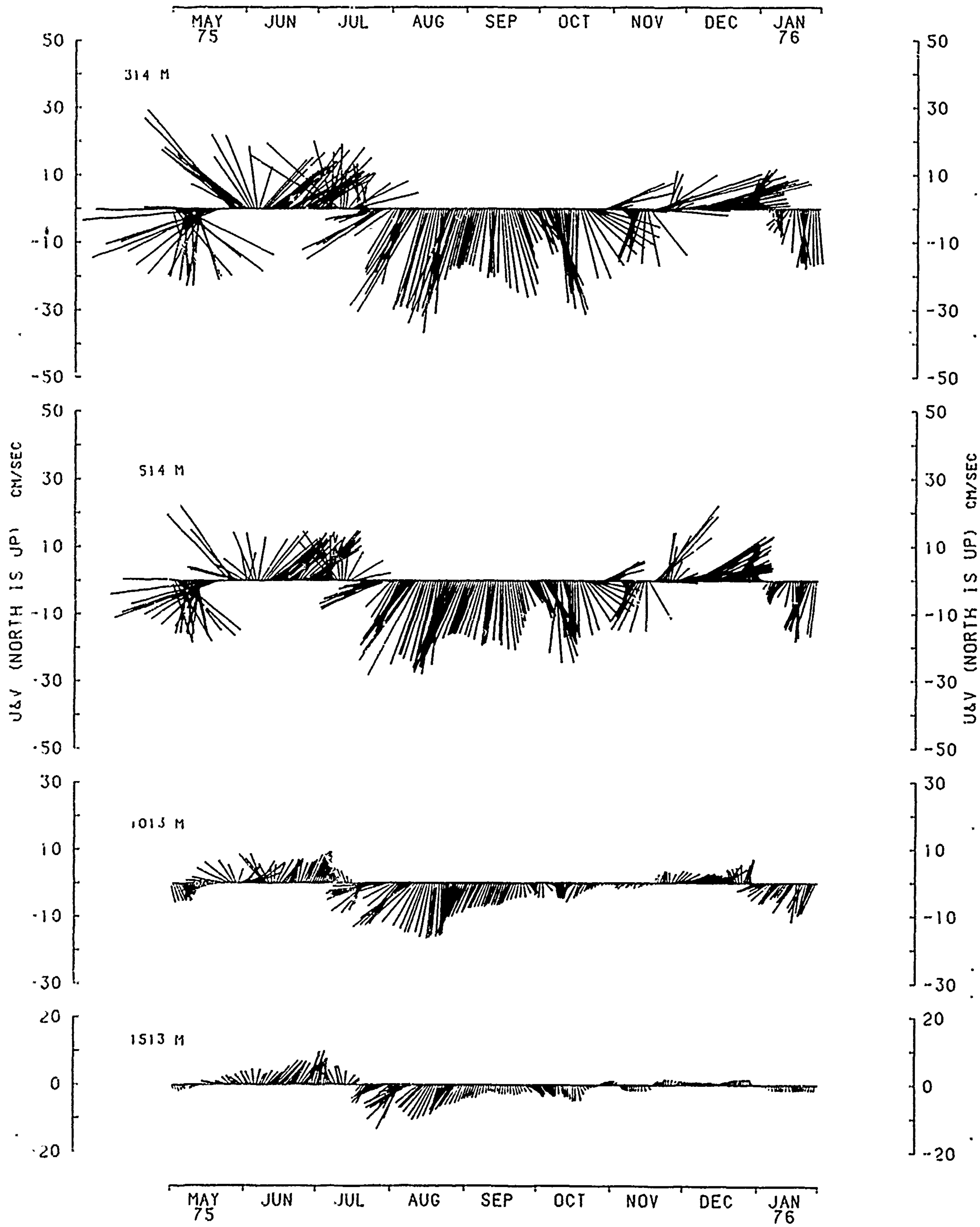
CURRENT VECTORS FOR MOORING 554



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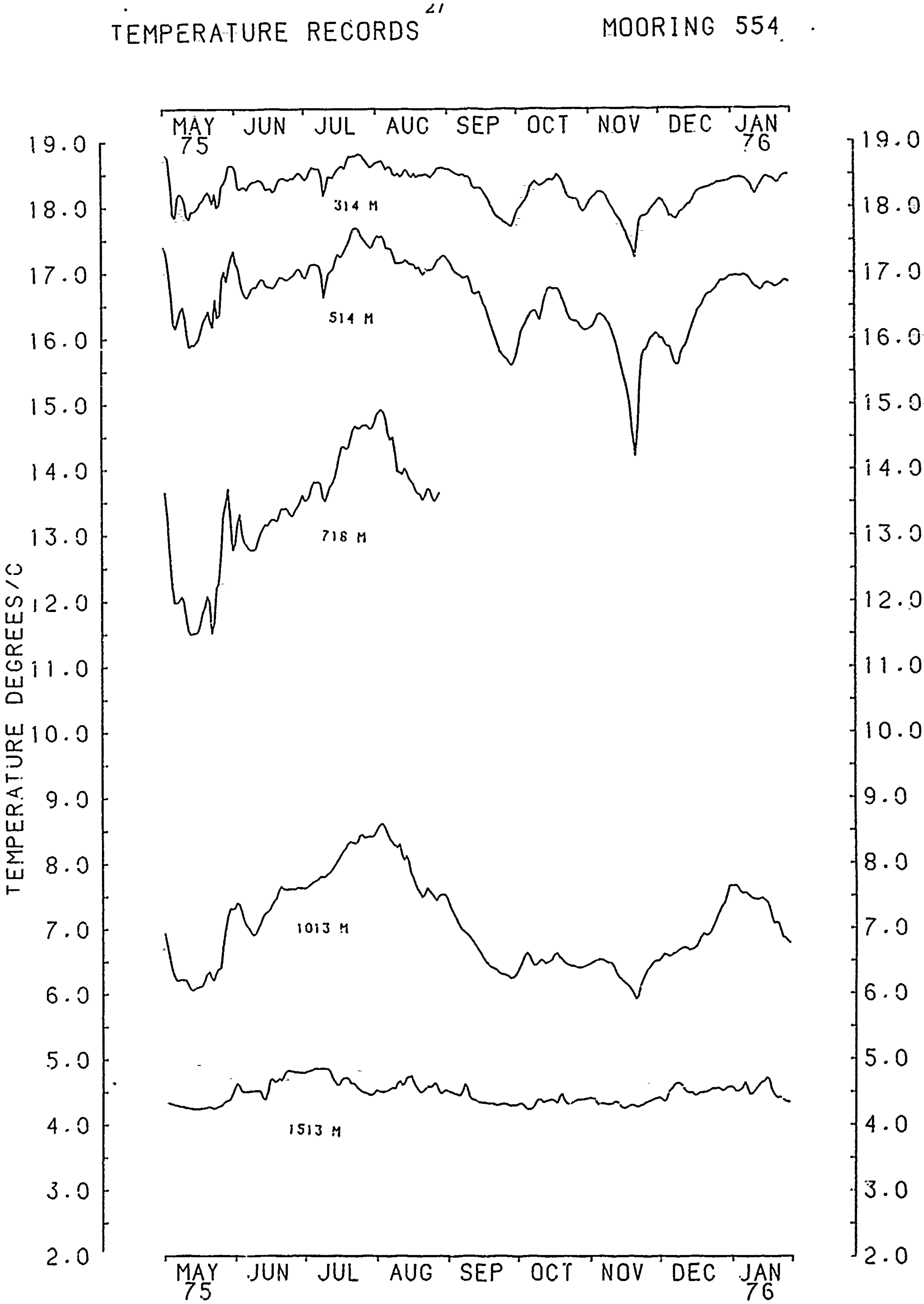
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SEP
OCT
NOV
DEC
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16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
TEMPERATURE DEGREES/C
314 M
514 M
718 M
1013 M
1513 M

Figure 17

CURRENT VECTORS FOR MOORING 555

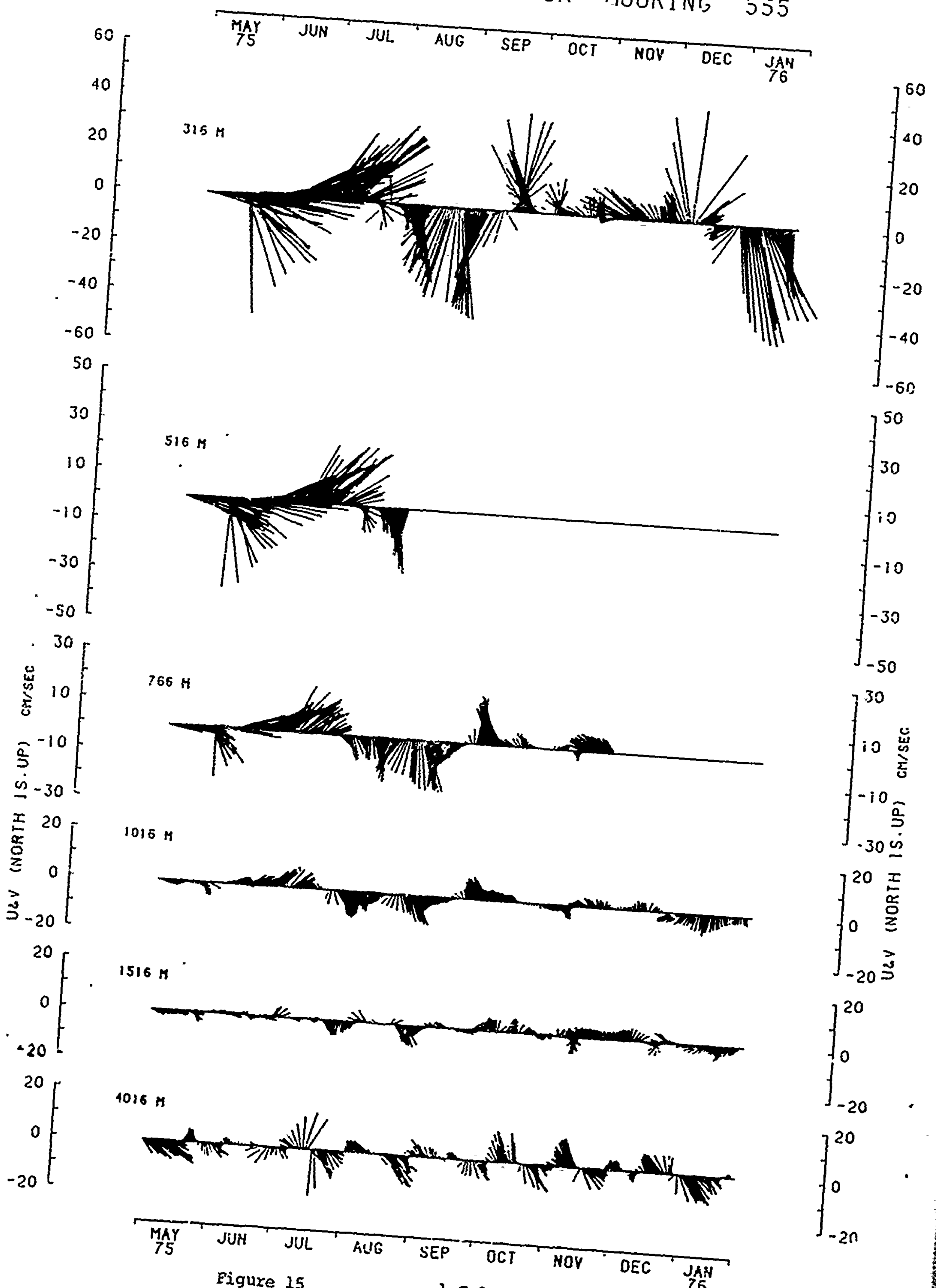
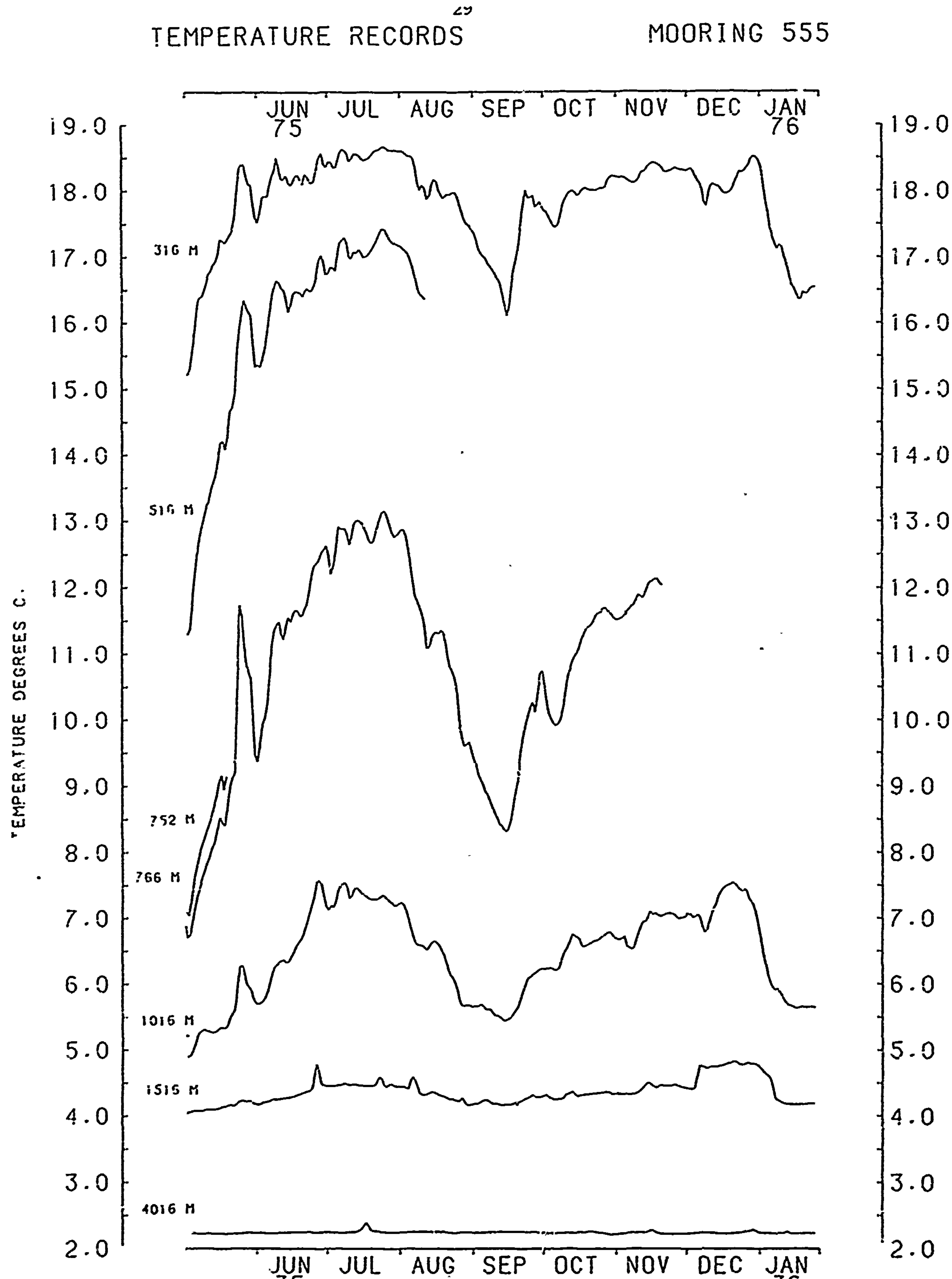


Figure 15



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JUL
AUG
SEP
OCT
NOV
DEC
JAN 76
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14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
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516 M
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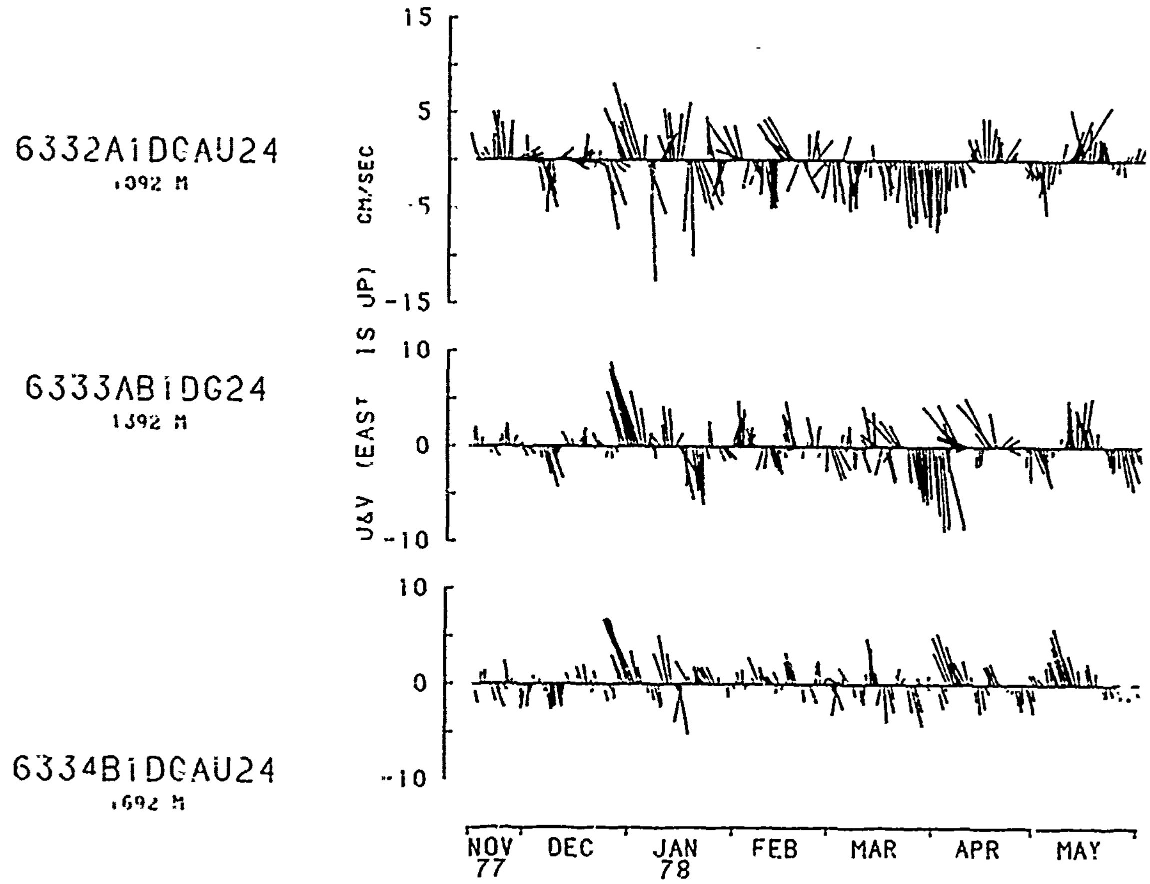
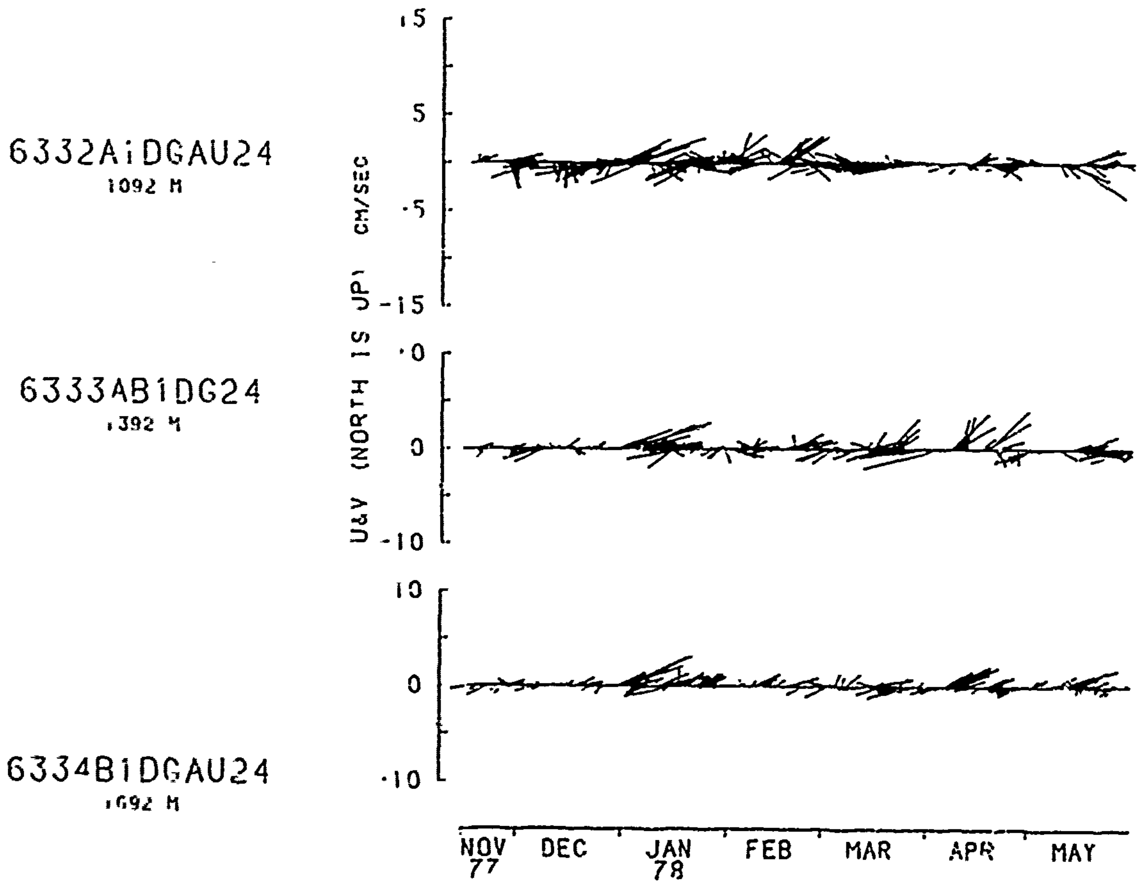
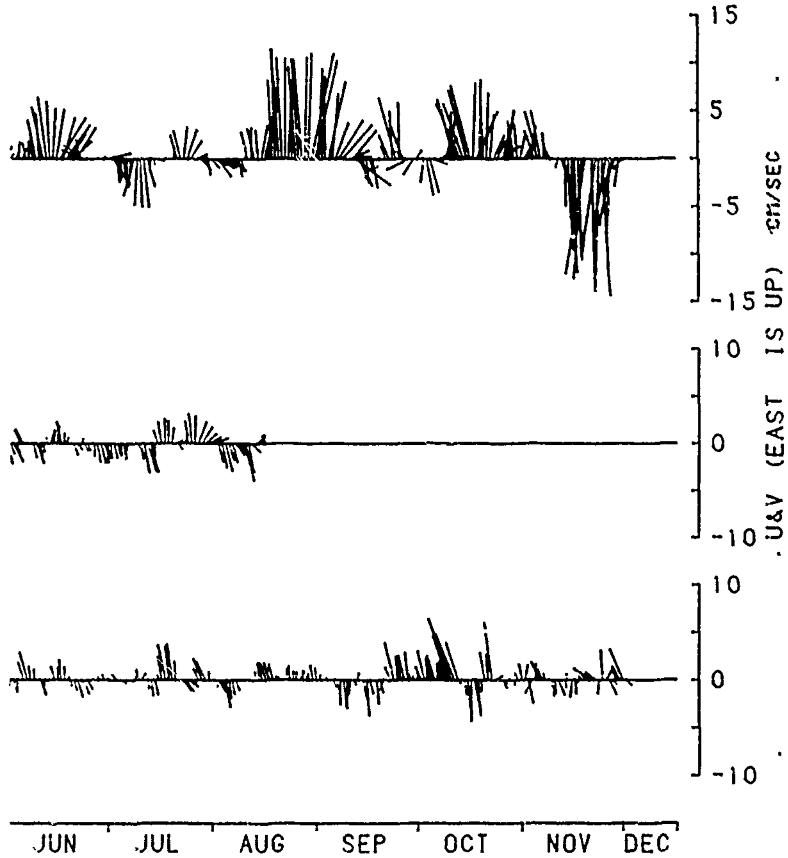
1515 M
4016 M

Figure 18

CURRENT VECTORS FOR MOORING 633



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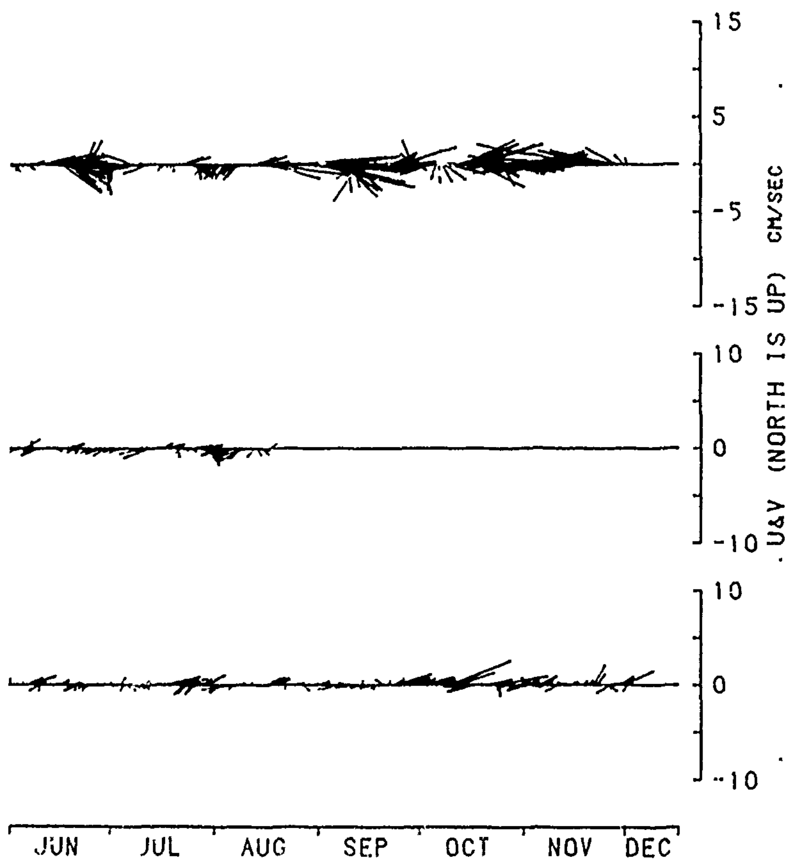
JUL
AUG
SEP
OCT
NOV
DEC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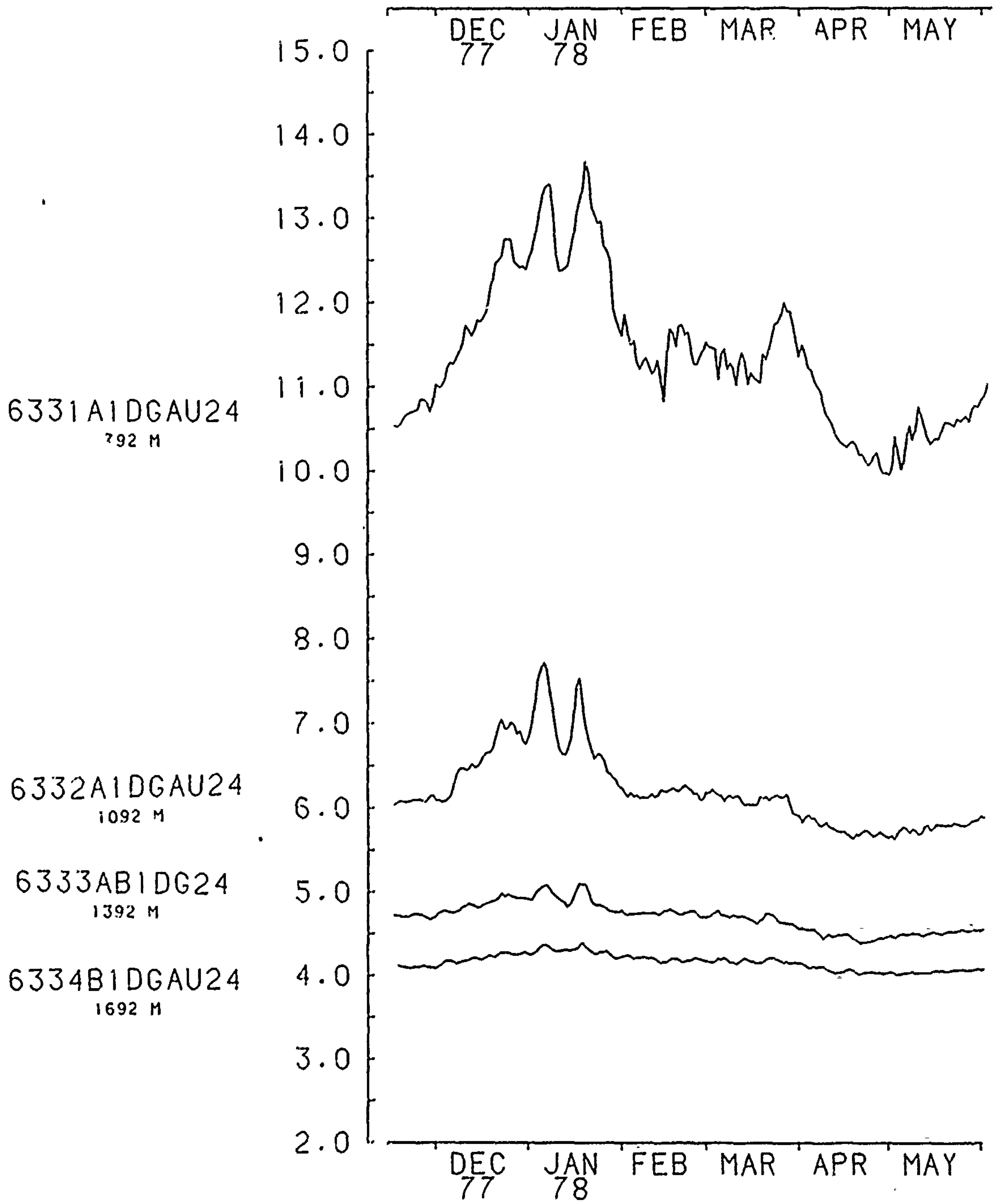
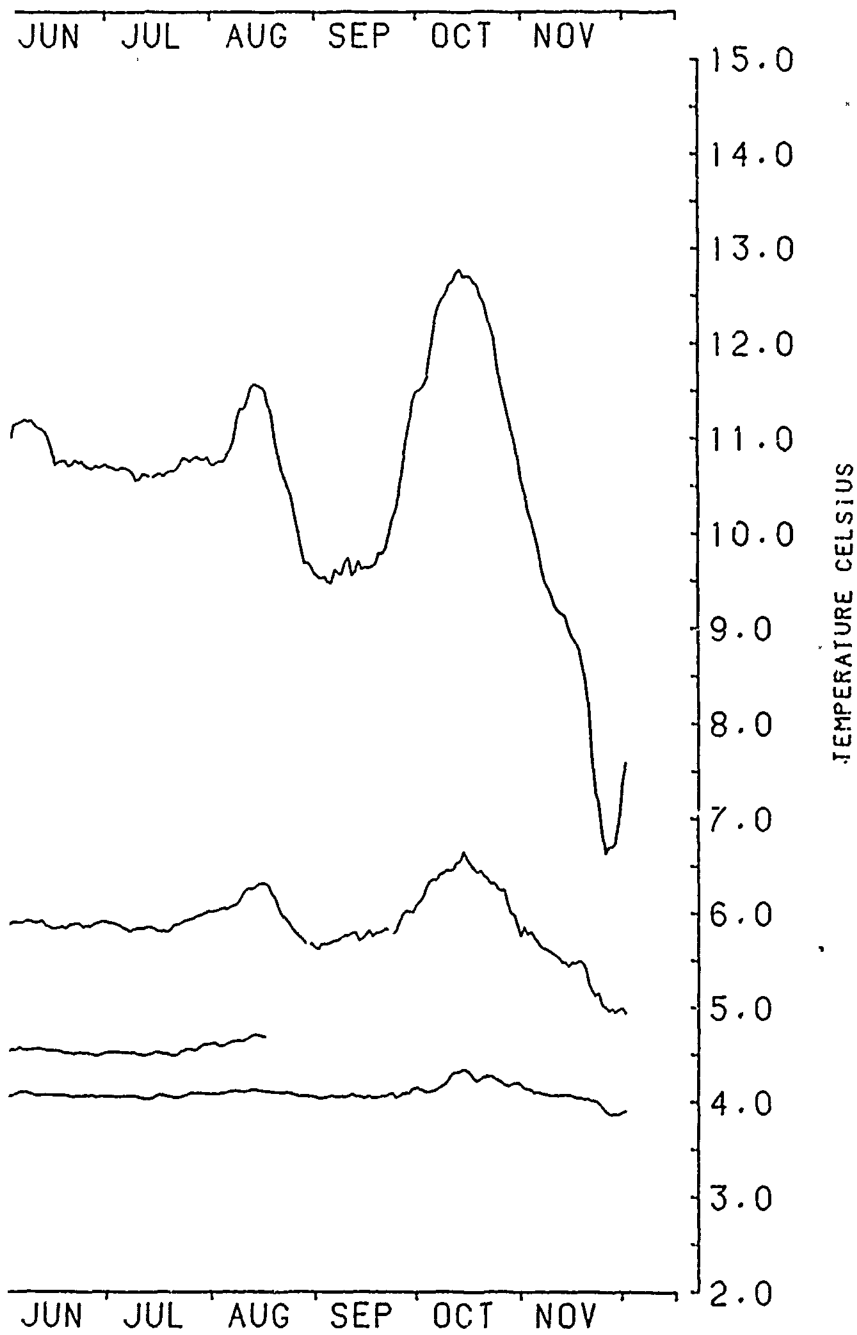
DEC

TEMPERATURE RECORDS MOORING 633

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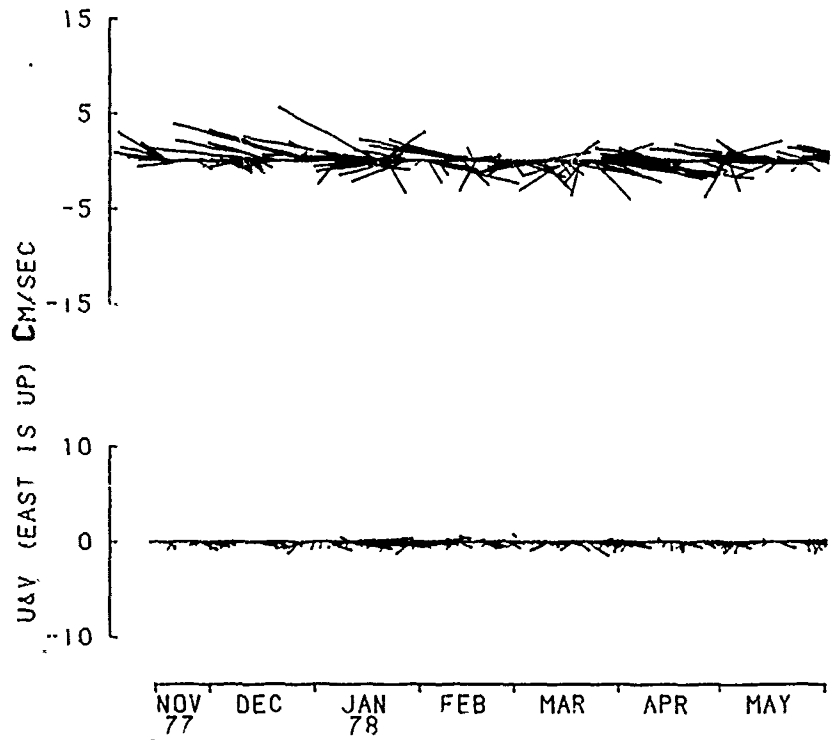
TEMPERATURE CELSIUS
JUN JUL AUG SEP OCT NOV

CURRENT VECTORS FOR MOORING 634



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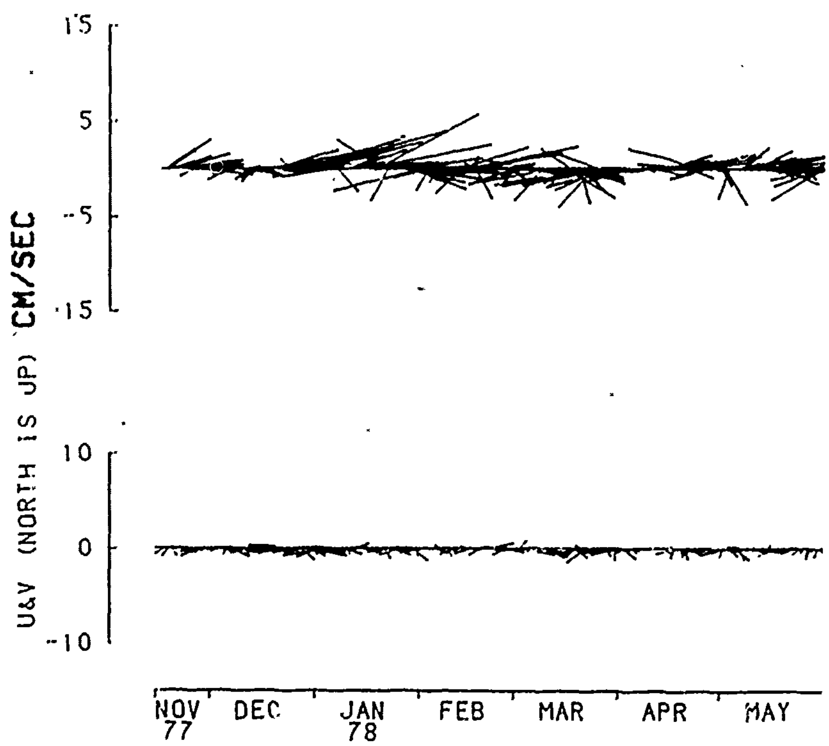

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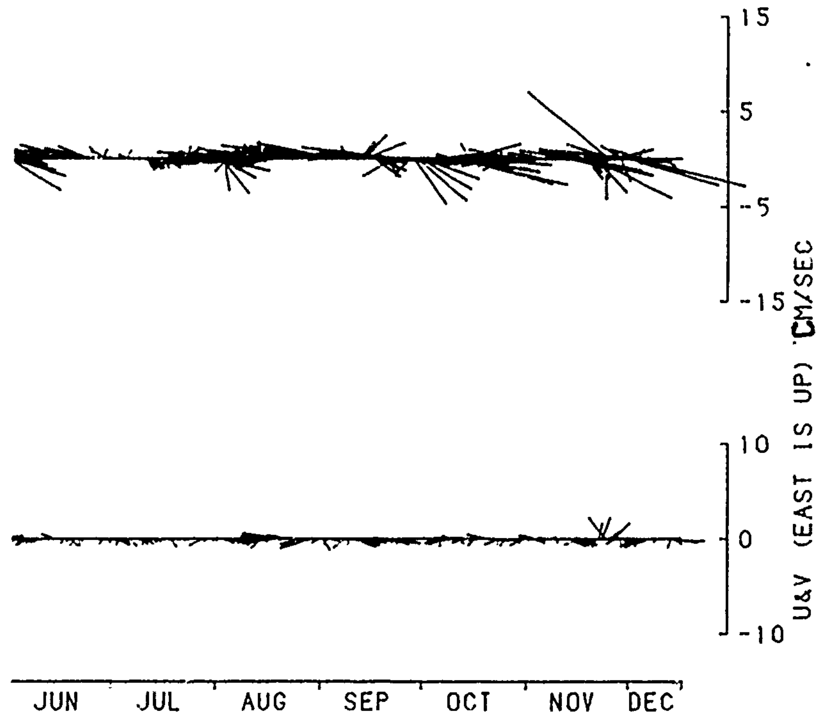
542 M

6343A1DGAU24
842 M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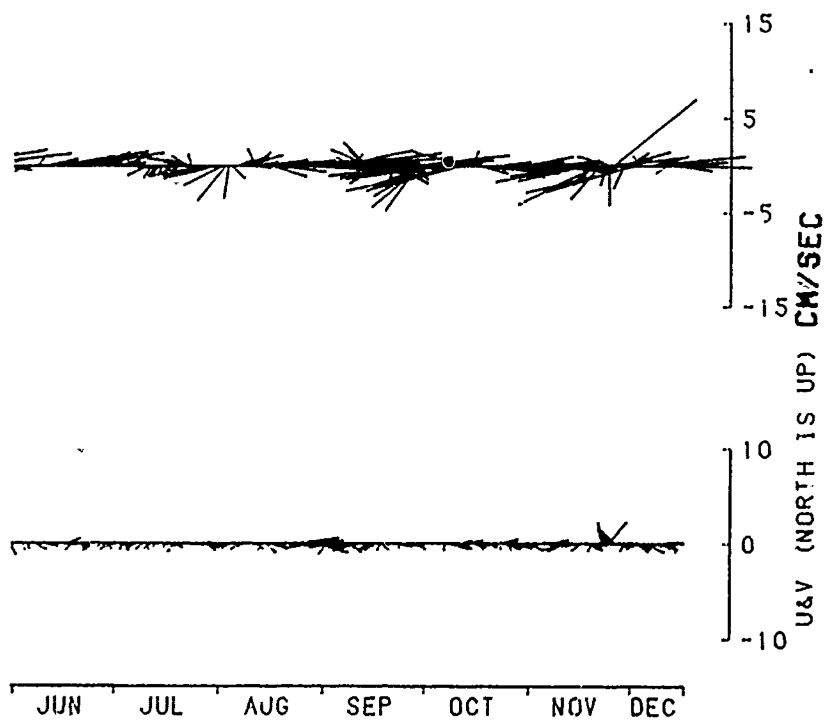
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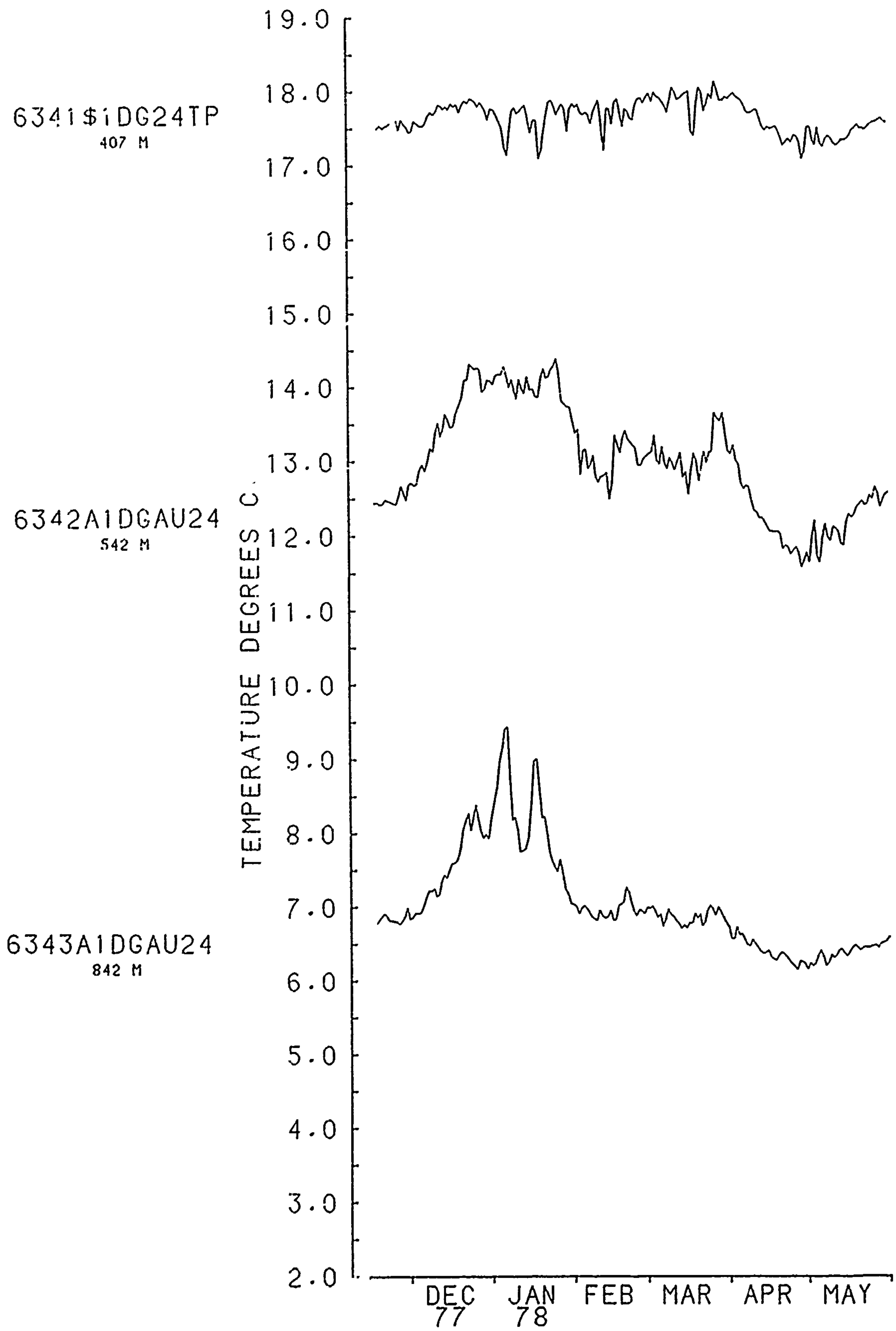
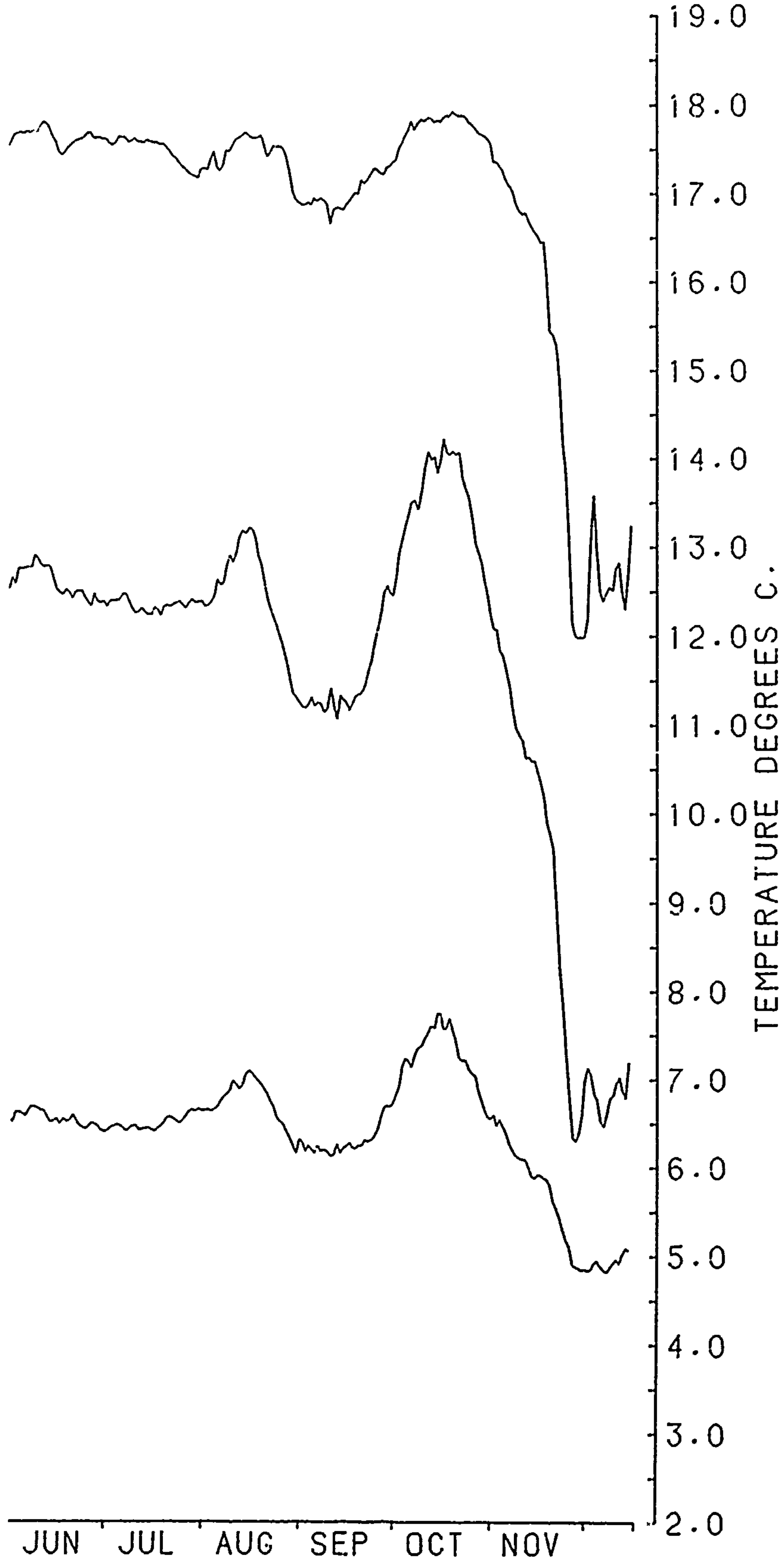
DEC

TEMPERATURE RECORDS MOORING 634

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5.0
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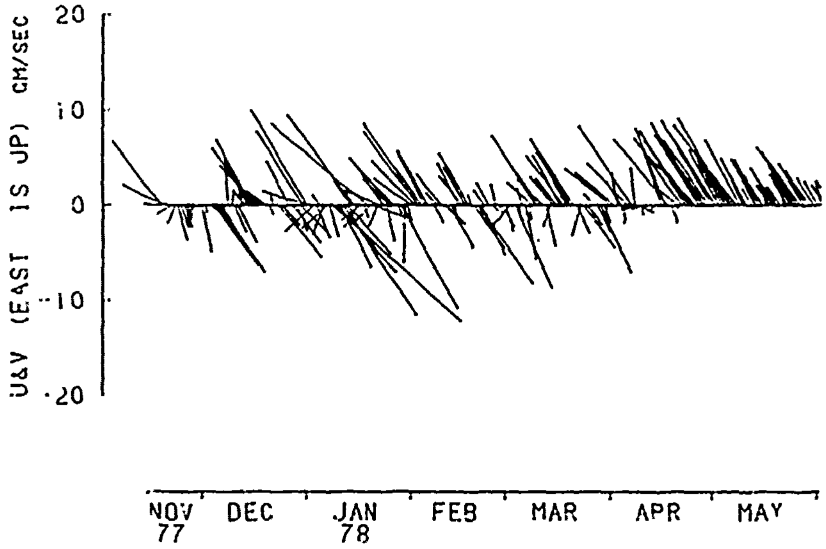
2.0
TEMPERATURE DEGREES C.
JUN
JUL
AUG
SEP
OCT
NOV

CURRENT VECTORS FOR MOORING 635



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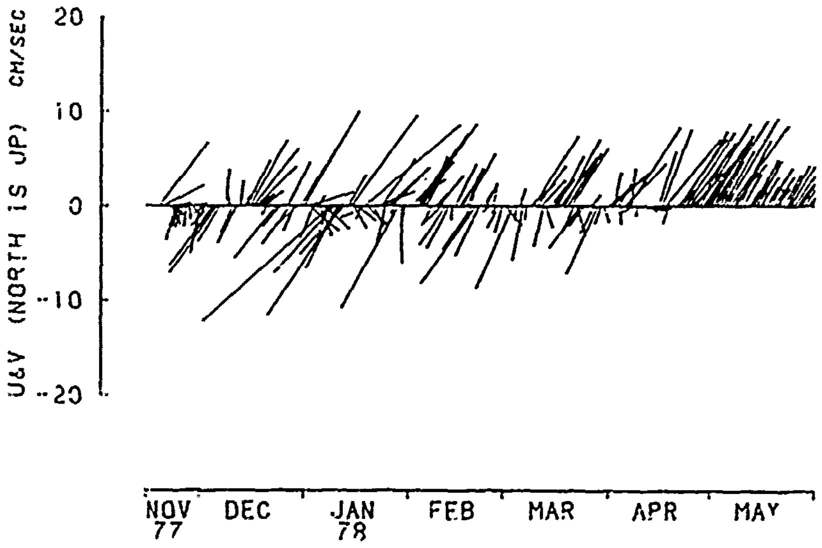

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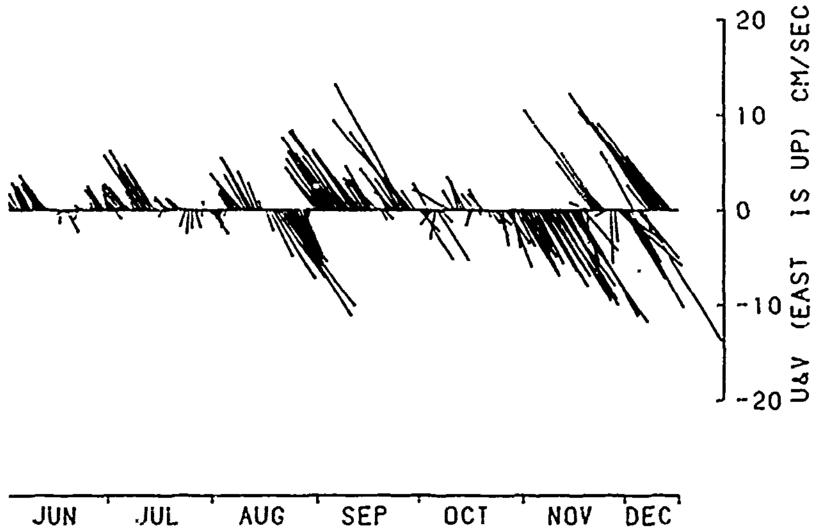

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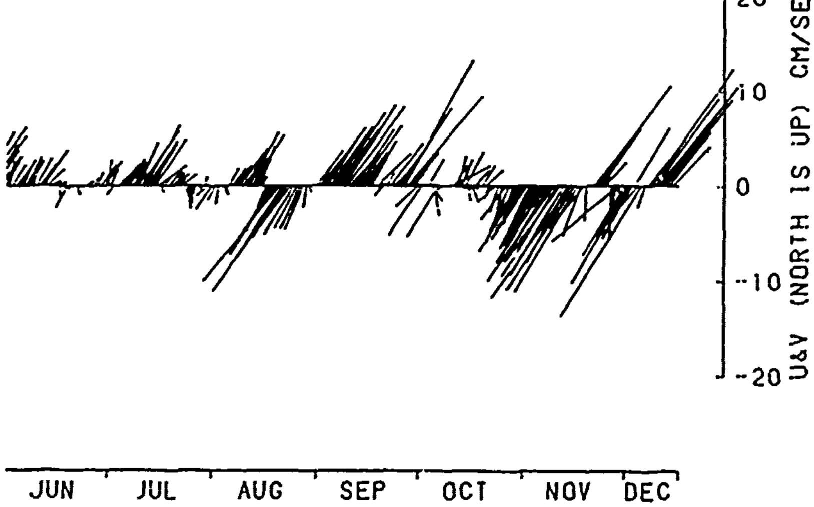
AUG
SEP
OCT
NOV
DEC



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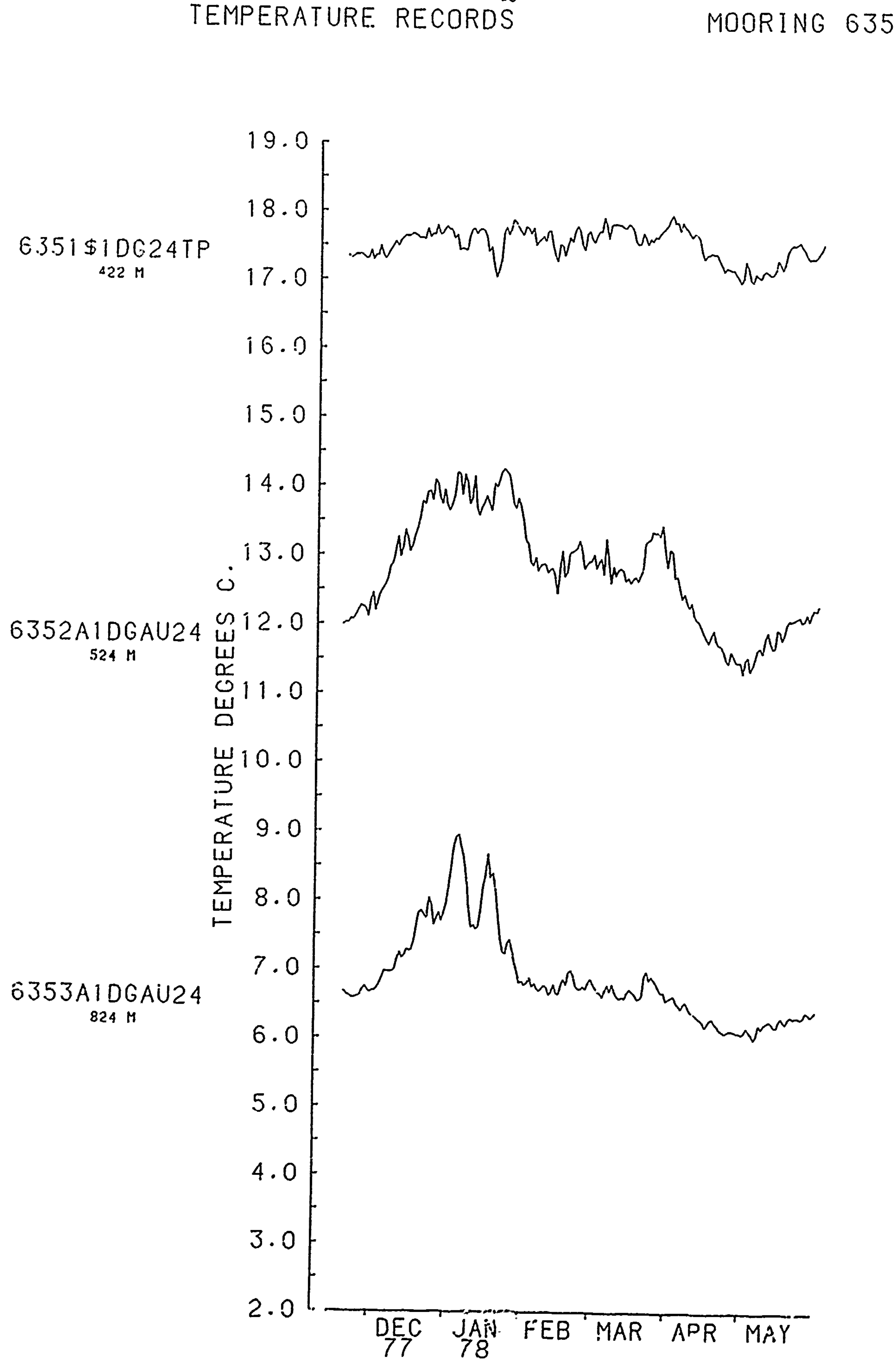
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6353A1DGAU24
824 M
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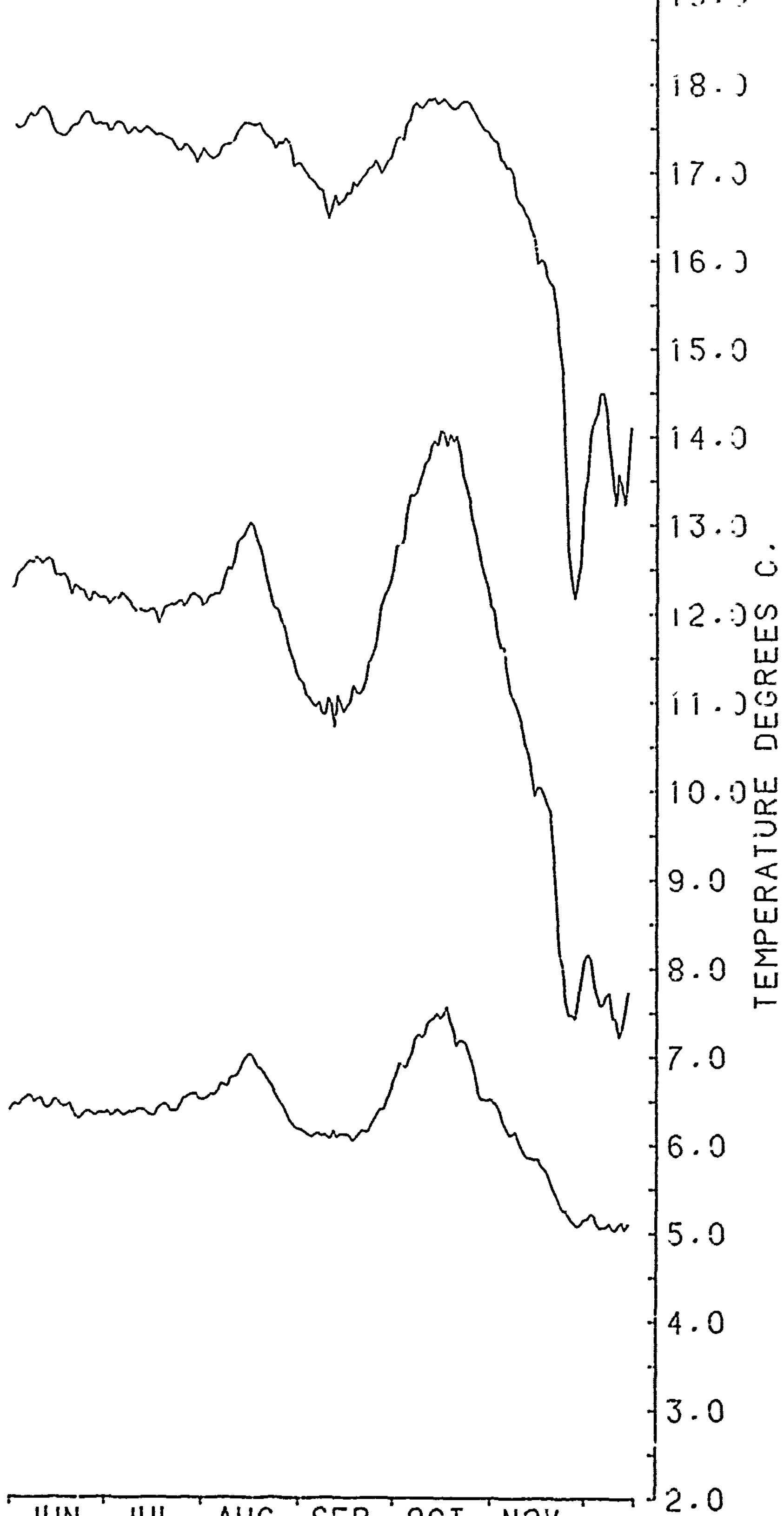
JAN 78
FEB
MAR
APR
MAY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TEMPERATURE DEGREES C.
JUN
JUL
AUG
SEP
OCT
NOV

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Woods Hole Oceanographic Institution
WHOI-81-68

A COMPILATION OF MOORED CURRENT-METER DATA FROM THREE TOPOGRAPHIC EXPERIMENTS: THE BERMUDA MICROSTRUCTURE ARRAY, THE ISLAND TRAPPED WAVES ARRAY AND THE GIBBS FRACTURE ZONE ARRAY. VOLUME XXVII by Theresa K. McKee, Erika A. Francis and Nelson G. Hogg. 41 pages. August 1981. Prepared for the Office of Naval Research under Contracts N00014-74-C-0262; NR 083-400 and N00014-76-C-0197; NR 083-400.

This report is a summary of information collected from three separate oceanographic experiments, each with three moorings, whose objectives were to study the influence of topography on low-frequency motions. Two arrays were set near Bermuda and one in the Charlie-Gibbs Fracture Zone (53°N, 34°W).
All the moorings were recovered after nine or thirteen months at sea. Temperature and current velocity data are displayed graphically as time series plots, histograms and spectra. Progressive vector plots and pressure time series are also presented. The data are summarized in statistical tables.

1. Ocean currents
2. Ocean temperatures
3. Moored instruments
I. McKee, Theresa K.
II. Francis, Erika A.
III. Hogg, Nelson G.
IV. N00014-74-C-0262; NR 083-400
V. N00014-76-C-0197; NR 083-400

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A COMPILATION OF MOORED CURRENT-METER DATA FROM THREE TOPOGRAPHIC EXPERIMENTS: THE BERMUDA MICROSTRUCTURE ARRAY, THE ISLAND TRAPPED WAVES ARRAY AND THE GIBBS FRACTURE ZONE ARRAY
VOLUME XXVII

by

Theresa K. McKee, Erika A. Francis
and
Nelson G. Hogg

WOODS HOLE OCEANOGRAPHIC INSTITUTION
Woods Hole, Massachusetts 02543

August 1981

TECHNICAL REPORT

Prepared for the Office of Naval Research under Contracts N00014-C-0262; NR 083-004 and N00014-76-C-0197; NR 083-400.

Approved for Distribution:

Valentine Worthington, Chairman
Department of Physical Oceanography

ABSTRACT

This report is a summary of information collected from three separate oceanographic experiments, each with three moorings, whose objectives were to study the influence of topography on low-frequency motions. Two arrays were set near Bermuda and one in the Charlie-Gibbs Fracture Zone (53°N, 34°W).

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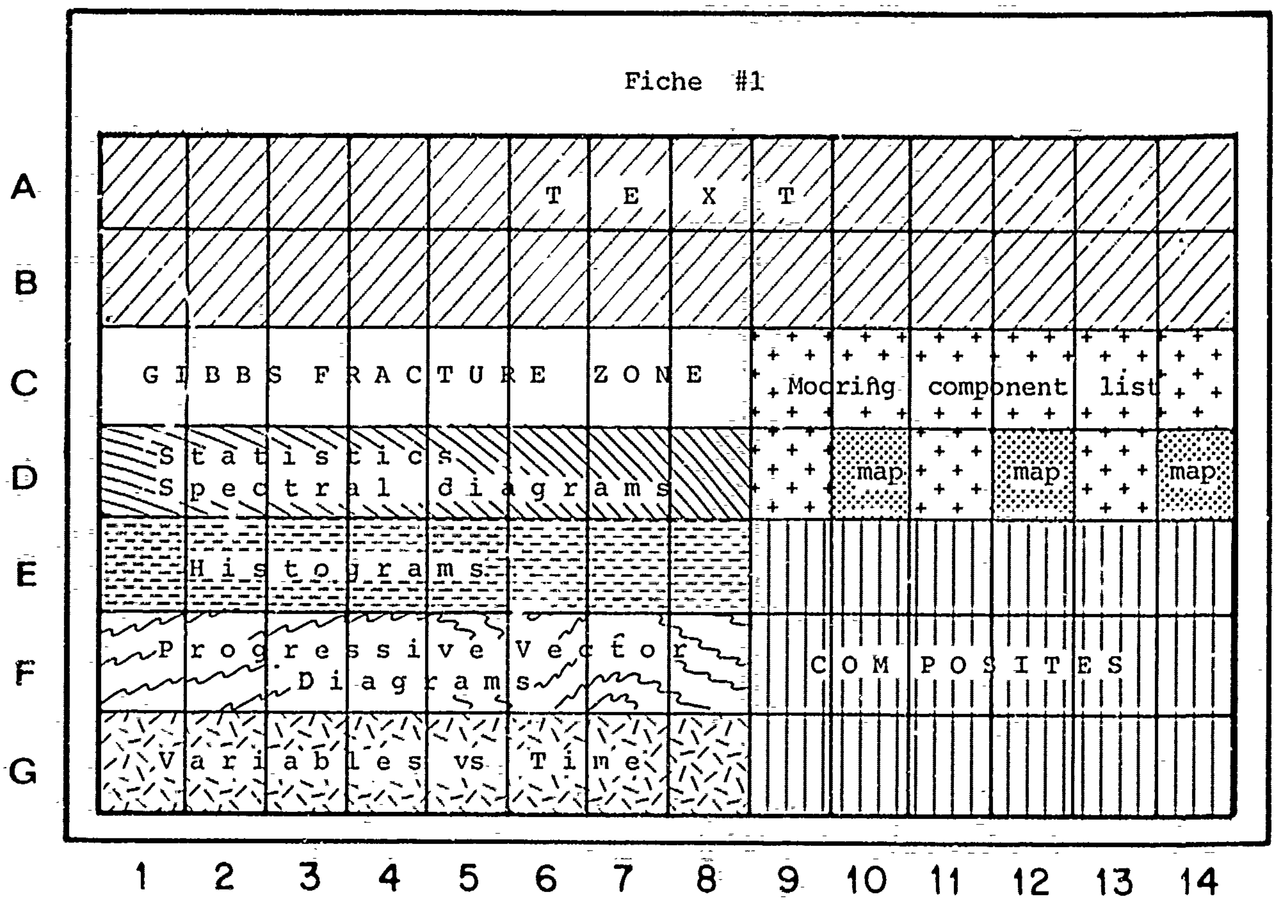
CONTENTS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C
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GIBBS FRACTURE ZONE
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map
map
Histograms
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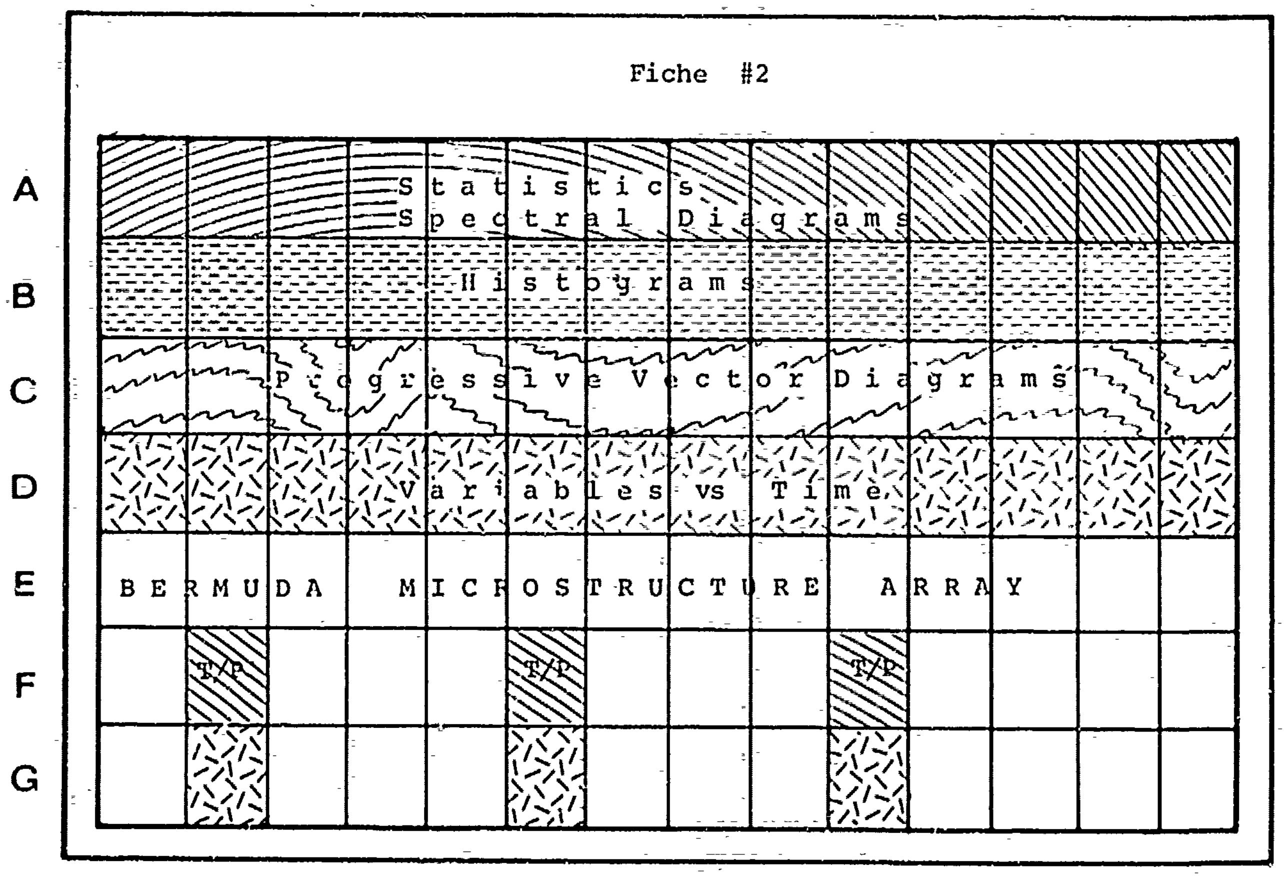
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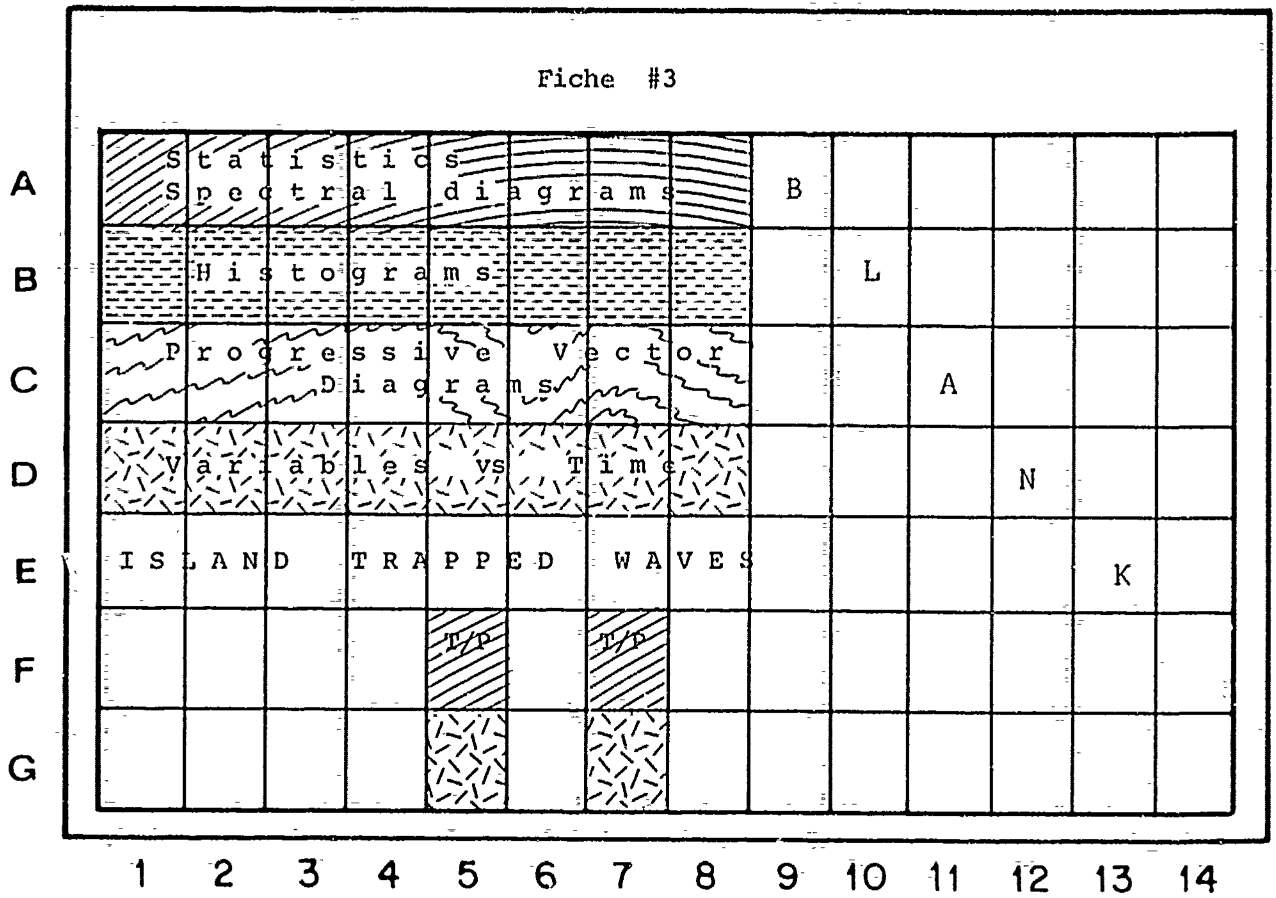
BERMUDA MICROSTRUCTURE ARRAY
T/P
T/P
T/P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Histograms
Progressive Vector Diagrams
Variables vs Time
ISLAND TRAPPED WAVES
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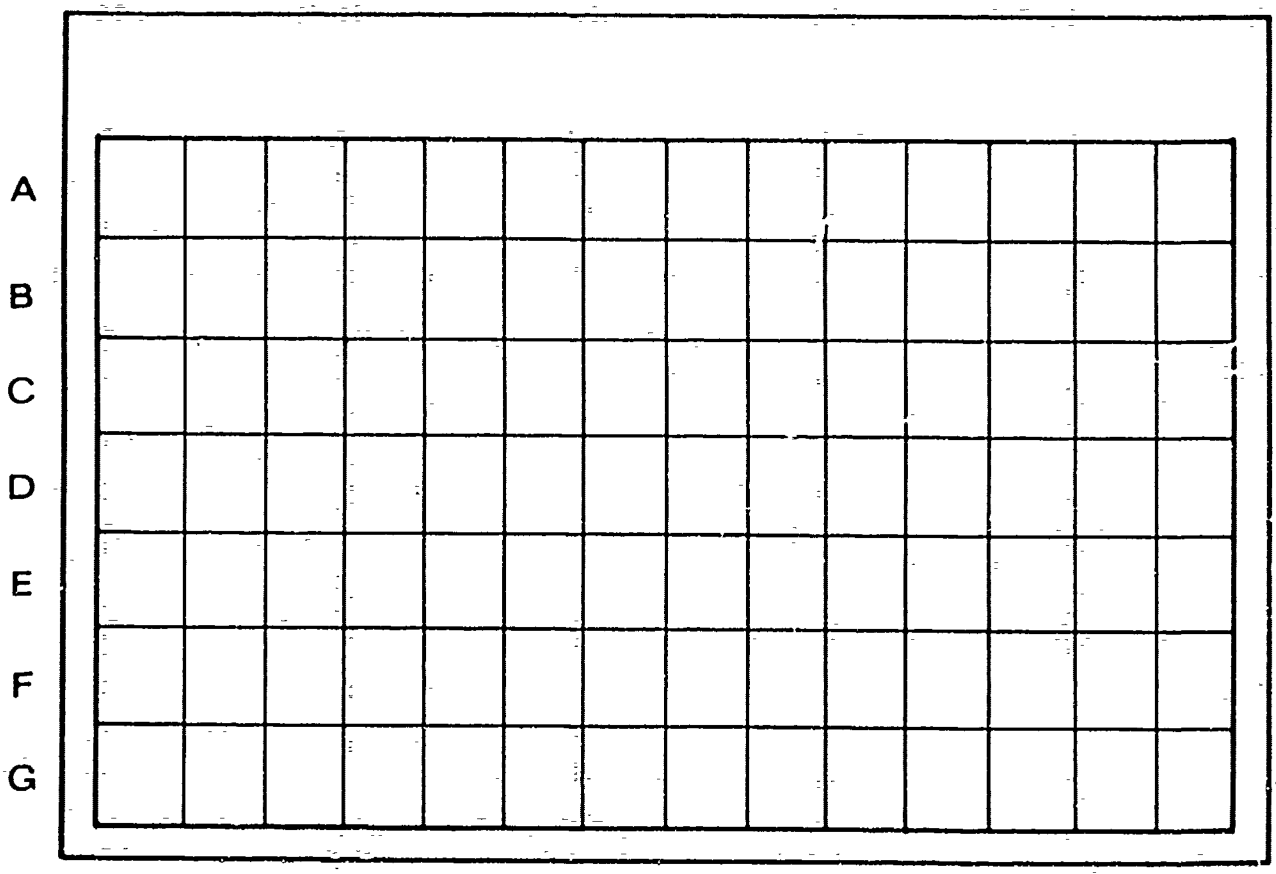
A
B
C
D
E
F
G

ACKNOWLEDGMENTS

The authors wish to acknowledge the moored array group's operations personnel for their work of organizing, deploying and recovering the instruments. They also would like to acknowledge the crews of the various ships involved in the work, with special mention of the effort of the people involved in the trip of the R/V Panulirus to pick up a mooring which had broken loose.

Data processors Ellen Levy, Ann Spencer and Susan Tarbell provided extensive help with the plots and layout of the report.

Acknowledgments are also due to the Office of Naval Research for its support. The work was performed under contract numbers N00014-74-C-0262, NR083-004 and N00014-76-C-0197, NR083-400.

PREFACE

This volume is the twenty-seventh in a series of Data Reports presenting moored current meter and associated data collected by the WHOI Buoy Group.

Volumes I through XXVI present data obtained during the years 1963-1978, arranged either by year or experiment (see notes).

A data directory and bibliography for the years 1963-1978 has been published, as WHOI Technical Report 79-88.

Volume XXVII presents data from the Bermuda Microstructure experiment, the Island Trapped Waves array and the Charlie-Gibbs Fracture Zone array.

Volume No.	WHOI Ref. No.		Notes Year Experiment
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III	67-66	Webster, F. and N. P. Fofonoff	
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VI	74-4	Tarbell, S.	1967 measurements
VII	74-52	Chausse, D. and S. Tarbell	1968 measurements
VIII	75-7	Pollard, R.T. and S. Tarbell	1970 Array Data
IX	75-68	Tarbell, S., M. G. Briscoe and D. Chausse	1973 IWEX Array
X	76-40	Tarbell, S.	1969a measurements
XI	76-41	Tarbell, S.	1969b measurements
XII	76-101	Chausse, D. and S. Tarbell	1973 MODE Array
XIII	77-18	Tarbell, S. and A. W. Whitlatch	1970 Measurements
XIV	77-41	Tarbell, S., R. Payne and R. Walden	1976 mooring 592 Saint Croix
XV	77-56	Tarbell, S. and A. W. Whitlatch	1971 measurements
XVI	78-5	Tarbell, S. and A. Spencer	1971-1975 MODE Site
XVII	78-49	Tarbell, S., A. Spencer and R. E. Payne	1975-1977 POLYMODE Array II
XVIII	79-65	Tarbell, S., M. G. Briscoe and R. A. Weller	1978 JASIN
XIX	79-34	Spencer, A., C. Mills and R. Payne	1974-1975 POLYMODE Array I
XX	79-56	Spencer, A.	1974 Rise Array
XXI	79-85	Mills, C. and P. Rhines.	1978 W.B.U.C.
XXII	79-87	Tarbell, S. and R. Payne.	1973 measurements
XXIII	80-40	Tarbell, S. and R. Payne.	1978 POLYMODE Array III
XXIV	80-41	Spencer, A., K. O'Neill and J. R. Luyten.	INDEX 1976
XXV	81-12	Spencer, A., E. D'Asaro and L. Armi.	BBL 1977
XXVI	81-45	Chausse, D. and R. E. Payne.	1972 measurements

PRESENTATION

The printed portion of this report contains introductory text and information about the instruments and data processing procedures. Tables and figures give summaries of the location of the instruments. Data are shown graphically in numerous composite displays.

The microfiche pages contain displays of the basic data. The data from the Gibbs Fracture Zone are shown on fiche 1, together with reproduction of the printed pages. Fiche 2 contains data from the Bermuda Microstructure experiment. Data from the Island Trapped Waves experiment are shown on fiche 3. The displays for the basic current meter data include spectral plots, tables of statistics, time series plots, progressive vector diagrams and frequency histograms. Time series plots, spectral plots and tables of statistics are shown for data from temperature/pressure recorders.

A detailed layout of the data on the microfiche sheets is shown on pages iii and iv.

INTRODUCTION

This report is a summary of information collected from three separate moored arrays, of nine or thirteen months duration. One array was deployed in the Charlie-Gibbs Fracture Zone to measure the mean flow and study the properties of the eddy field. The other two were deployed near Bermuda, one relatively far from the island and one close to the island. The objectives of the Bermuda experiment were to monitor low frequency motions during a shipboard investigation of microstructure near the island and to study low-frequency baroclinic waves trapped by the island.

Three moorings were set in September 1975 in the Charlie-Gibbs Fracture Zone, a deep east-west channel through the Mid-Atlantic ridge at 53° north (see Figure 1 and Table 1). Objectives were to measure the mean flow and investigate the properties of the mesoscale eddy field at this latitude and their interaction with the underlying topography. Results are reported in Schmitz and Hogg (1978) and Hogg and Schmitz (1980). The moorings were recovered in June 1976, giving 7 nine-month records. Data return is summarized in Table 2.

The first Bermuda array was set in April, 1975, in approximately an equilateral triangle configuration with 100 km sides and Bermuda at the center (see Figure 2 and Table 1). It was designed to monitor the background mesoscale eddy field during an intensive investigation of possible microstructure generation processes near the island (as a part of FAME, the north Atlantic Fine and Microstructure Experiment, Sanford and Hogg, 1977). The mooring and related hydrographic results are described in Hogg, Katz and Sanford (1978). The array was recovered in January, 1976, giving records of up to 9 months duration. Instrument performance is summarized in Table 3.

In these current meter records, there were suggestions of coherent motions (trapped waves) travelling clockwise around Bermuda. This prompted the setting of the second array (the "Island Trapped Waves" experiment) in November 1977 (see Figure 3 and Table 1) which was designed to be in the near field of the trapped wave motions. Results from this experiment have been reported by Hogg (1980). The array was recovered in December, 1978 after more than a years deployment, although one mooring released prematurely two weeks earlier and was found by a local fisherman. Data return is summarized in Table 4.

INSTRUMENTATION

Current Meters

The current meters described in this report were Vector Averaging Current Meters (VACMs), built by AMF SeaLink Systems (now EG&G SeaLink Systems), or Model 850 current meters built by Geodyne, now a part of EG&G.

Each time a pair of rotor magnets passes the sensing diode, the VACM samples compass and vane information and computes a measure of east and north water current components. These components are summed through the entire recording interval, usually 15 minutes, thus giving a true vector average. One complete rotor revolution initiates 8 compute cycles. Temperature is derived from a voltage-to-frequency converter (v/f), whose output frequency is related to the thermistor resistance at its input. The v/f output pulses are summed over the entire recording interval, thus averaging temperature. The thermistors are routinely calibrated before and after deployment and the temperatures are accurate to ±.01°C (Payne et al., 1976). All variables are recorded on a cassette tape at the end of each recording interval.

The Model 850 current meter stores burst sampled data on magnetic tape cartridges. The instrument collects and stores 23 or 24 data cycles sampled at 5.27 second intervals. It then turns off for the remainder of the recording interval (usually 15 or 30 minutes). Model 850's, which have been modified to include temperature measurements, accumulate the count from the temperature circuit from one 5.19 second period and record it at the beginning of each data burst.

Time was measured using a quartz crystal oscillator with a manufacturer's specified accuracy of ±1 second per day. All stated times are in UTC (Universal Coordinated Time). The instrument clock times were synchronized with UTC before mooring launch. After recovery, differences in the two times were noted.

Two of the instruments (5532 and 5552) were modified to record differential temperature (tdif). A thermistor was mounted externally at each end of the VACM pressure case (a distance of 1.74 meters apart), and a differential resistance was measured and recorded. The lithium batteries in the instruments failed shortly after deployment, giving short records of all variables. See McCullough (1975) and Dean (1979) for further information.

One of the VACMs (6331) contained a pressure transducer, manufactured by Paine. It is a strain gauge with a rated accuracy of .05 per cent of full scale. The instrument is routinely calibrated before deployment.

Temperature/Pressure Recorder

An instrument to record temperature, pressure and time (T/P) was developed in the Draper Laboratory at MIT for MODE-1 and has been used extensively since 1973. The instrument stores a sample every 15 seconds and records the sum of 128 successive data samples every 32 minutes on a magnetic tape cassette (128 x 15 = 1920 seconds = 32 minutes).

Temperatures have a resolution of .001°C (Wunsch and Dahlen, 1974). The absolute accuracy is not specified.

The pressure sensor is a strain gauge with a manufacturer-specified accuracy of .03 per cent of full scale (Wunsch and Dahlen, 1974). These sensors are recalibrated for each instrument deployment.

MOORINGS

Details of the mooring configuration are shown in Tables 5-13. The items on each mooring are listed. Depths in meters and data names are included for data recording instruments.

The anchor was usually a cylinder weighing from 2000-2700 pounds (wet weight). In the Gibbs Fracture Zone, the anchor on the short mooring weighed 1000 pounds.

Items with the words "glass spheres" refer to glass flotation spheres of 16" or 17" diameter with hard hats, each one bolted to 3/8" chain at 1 meter intervals.

Milliman samples are corrosion measuring devices, attached to the mooring wire.

Figures 1 through 3 show mooring locations and Tables 1 through 4 give summaries of the instruments, their depths and the quality of the data.

See Heinmiller (1976) for a more complete description of WHOI moorings.

DATA PROCESSING

Current Meters

The data from the instrument tapes were transcribed to 9-track magnetic tapes, converted to scientific units, edited to remove launch and retrieval transients and bad points, and linearly interpolated across missing or erroneous data cycles.

WHOI data are identified by a mooring number, a sequential instrument position number (e.g., 5713 is the third instrument down on mooring 571), a letter to indicate the data version (e.g., 5713B is the second editing of 5713), and a number to indicate the time sampling interval for that data record (e.g., 5713B1800 is the half-hour (1800 seconds) averaged version).

Low-passed versions of data series were formed by passing the data through a Gaussian filter with a 24 hour half-width, and then subsampling the filtered series once a day. The composite plots shown for each mooring and the time series plots and progressive vector plots on the microfiche use these low-passed data files.

Temperature/Pressure Recorders

Cassette reading and preliminary data processing were carried out at MIT. The basic time series received by WHOI had been truncated to remove launch and retrieval transients, but detailed editing was done at WHOI. Basic spectral plots, time series and statistics are shown for the T/Ps, and the low-passed temperature data are shown on the composite temperature plots for each mooring.

PROGRAMS

Time Series Plots

Current meter and T/P variables versus time are presented graphically. All the plots are based on low-passed time series.

Statistics

Statistics for each variable measured by the current meters and T/P's are presented on microfiche. Mean, standard error, variance, kurtosis and extrema are given for all the variables; east and north covariance, correlation and other statistics are given for the vectors. The data series used is based on the instrument sampling interval. For reference, note that a Gaussian random variable would have a kurtosis of three and a skewness of zero.

See Tarbell, Spencer and Payne, (1978) for a more detailed discussion of these parameters.

Progressive Vector Plots

Based on a low-passed time series, the current vectors are placed tail-to-head so as to show the path that a perfect particle in a perfectly homogeneous flow would have travelled. Flow regimes and low frequency behavior show up well on this type of plot. The plot begins with an asterisk and the first day of each month is marked with a plus sign and every 5th month is annotated.

Vector Stick Plots

The 24-hour averaged current components are plotted as individual vectors along a time scale. Unless otherwise indicated, the vector orientation is such that north is upwards on the page.

The vector roses show current vectors sampled every 7 days, plotted at the location of the mooring.

Histograms

The variables temperature, speed and direction are shown as frequency of occurence versus amplitude plots. The mean for each data series is marked.

Spectra

The horizontal kinetic energy (HKE) and temperature are displayed as spectra. The HKE spectrum is half of the sum of the spectra of the east and north components. It has the advantage of not being tied to a particular coordinate system.

The HKE and temperature have units of $(cm^2/sec^2)/cph$ and $(°C)^2/cph$ respectively. The spectra are all one-sided, i.e., the area under the spectrum is equal to the variance of the original record. The plots are log-log rather than 'variance preserving', i.e., the contributions of various frequency bands to the total variance are not in proportion to the displayed areas.

The spectra are calculated based on data sequences of 3240 or 4000 points ('pieces'). Frequency band averaging is across three frequencies and no data-windowing or prewhitening is done.

The WHOI spectral program TIMSAN (Hunt, 1977) averages the spectra in increasingly large groups at the high frequencies to prevent having to plot thousands of points. This procedure gives few degrees of freedom (d.o.f) at the low frequencies, and many at the high frequencies. For the spectra calculated from one piece with three frequencies averaged there are 6 d.o.f. in the lowest frequency group, and 600 d.o.f. in the highest frequency group.

REFERENCES

Dean, J. P., 1979, A Moored Instrument for Vertical Temperature Gradients. J. Geophys. Res. 84, 5089-5091.

Heinmiller, R. H., 1976, Woods Hole Buoy Project Moorings, 1960-1974. WHOI Ref. 76-53 (Technical Report).

Hogg, N. G., 1980. Observations of internal Kelvin Waves trapped round Bermuda. J. Phys. Ocean. 10, 1353-1376

Hogg, N. G., E. J. Katz and T. B. Sanford, 1978. Eddies Islands and Mixing. J. Geophys. Res. 83, 2921-2938.

Hogg, N. G. and W. J. Schmitz,Jr.,1980. A dynamical interpretation of low frequency motions near very rough topography - the Charlie-Gibbs Fracture Zone. J. Mar. Res. 38, 215-248.

Hunt, M., 1977, A program for spectral analysis of time series. WHOI Technical Memorandum 2-77.

McCullough, J. R., 1975, Vector Averaging current meter speed calibration and recording technique. WHOI Ref. 75-44 (Technical Report.)

Payne, R. E., A. L. Bradshaw, J. P. Dean and K. E. Schleicher, 1976, Accuracy of temperature measurements with the V.A.C.M. WHOI Ref. 76-94 (Technical Report).

Sanford, T. B. and N. G. Hogg, 1977. The North Atlantic fine and microstructure cruise, Knorr 52 and Eastward 75-12. WHOI Ref. 77-11. (Technical Report)

Schmitz, W. J. Jr. and N. G. Hogg, 1978. Observations of energetic low frequency current fluctuations in the Charlie-Gibbs Fracture Zone. J. Mar. Res. 36, 725-734.

Tarbell, S., A. Spencer and R. E. Payne, 1978. A compilation of moored current meter data and associated oceanographic observations. Vol XVII (POLYMODE Array II data). WHOI Ref. 78-49 (Technical Report).

Wunsch, C., and J. Dahlen, 1974, A moored temperature and pressure recorder. Deep-Sea Res., 21, 145-154.

TABLE CAPTIONS

FIGURE CAPTIONS

TABLE 1

SUMMARY OF MOORINGS

Mooring No.	No. of instruments	Date Set	Date Retr.	Location	Bottom Depth (m)
		CHARLIE-GIBBS FRACTURE ZONE ...Cruise...			
		Knorr 51	Knorr 54 Leg 7		
570	1	Sep. 26 1975	June 24 1976	52° 42.7'N 33° 59.2'W	4288
571	3	Sep. 27 1975	June 26 1976	52° 53.7'N 35° 31.0'W	2895
572	4	Sep. 27 1975	June 25 1976	52° 46.1'N 35° 30.0'W	3398
		BERMUDA MICROSTRUCTURE ARRAY ...Cruise...			
		Knorr 49	USCGC Evergreen		
553	5	Apr. 28 1975	Jan. 26 1976	31° 46.9'N 64° 26.2'W	4353
554	5	Apr. 29 1975	Jan. 26 1976	32° 21.5'N 65° 27.0'W	4774
555	7	Apr. 9 1975	Jan. 25 1976	32° 59.0'N 64° 23.8'W	4527
		ISLAND TRAPPED WAVES EXPERIMENT ...Cruise...			
		RV Erline	Oceanus 52 Leg III		
633	4	Nov. 15 1977	Dec. 7 * 1978	32° 33.8'N 64° 44.7'W	1611
634	3	Nov. 16 1977	Dec. 16 1978	32° 32.2'N 64° 44.1'W	942
635	3	Nov. 17 1977	Dec. 17 1978	32° 22.4'N 65° 0.9'W	924

* Recovered by R/V Panulirus.

TABLE 2

DATA RETURN AND QUALITY

RECORDS FROM CHARLIE-GIBBS FRACTURE ZONE

Record No.	Inst. depth (m)	Data Dates 1975 - 1976	No. of days	Data presented	Comments
5701	4227	Sep.27 - June 24	271	V T *	
5711	1007	Sep.28 - June 26	272	V T	
5712	2537	Sep 28 - Nov. 4/75	39	V T	Electronic problems
5713	2835	Sep 28 - June 26	272	V T	
5721	998	Sep.28 - June 25	271	V T	
5722	2528	Sep.28 - June 25	271	V T	
5723	3060	Sep.28 - June 25	271	V T	
5724	3360	Sep.28 - June 25	271	V T	

V Velocity component data presented
T Temperature " "

* There were 2 thermistors on this current meter. The records were virtually identical, only one series is displayed

TABLE 3

DATA RETURN AND QUALITY

RECORDS FROM BERMUDA MICROSTRUCTURE ARRAY

Record No.	Inst. depth (m)	Data Dates 1975 - 1976	No. of days	Data presented	Comments
5531	306	Apr.29 - Jan.26	272	V T	
5532	506	Apr.29 - Oct.15/75	170	V T TD	Errors on sea tape
5533(T/P)	734	Apr.29 - Jan.26	272	T P	
5534	1005	Apr.29 - Jan.26	272	V T	
5535	1505	Apr.29 - Jan.26	272	V T *	Vane stuck after Sept.15 Rotor stuck after Dec. 1
5541	314	Apr.29 - Jan.26	271	V T	
5542	514	Apr.29 - Jan.26	271	V T	
5543(T/P)	718	Apr.29 - Aug.29/75	122	T P	Battery depleted
5544	1013	Apr.29 - Jan.26	271	V T	
5545	1513	Apr.29 - May 25/75	26	V T #	Vane stuck after May 26. Rotor below threshold after Oct. 19
5551	316	Apr.30 - Jan.25	270	V T	
5552	516	Apr.30 - Aug.12/75	104	V T TD	Battery leaked
5553(T/P)	752	Apr.29 - May 20/75	20	V T	Electronic problem
5554	766	Apr.29 - Nov.21/75	206	V T	Battery leaked
5555	1016	Apr.30 - Jan.25	270	V T	
5556	1516	Apr.30 - June 12/75	44	V T #	Corrosion in vane vane stuck after June 13
5557	4016	Apr.30 - Jan.25	270	V T	

All instruments were current meters except where noted (T/P)

V	Velocity component data presented
P	Pressure " "
T	Temperature " "
TD	Instrument also had differential temperature sensors
*	No data is presented for the basic velocity series Time series are shown for all low-passed data.
#	All data is presented for the stated interval. A questionable full-length series is used to show provecs and time series plots.

TABLE 4

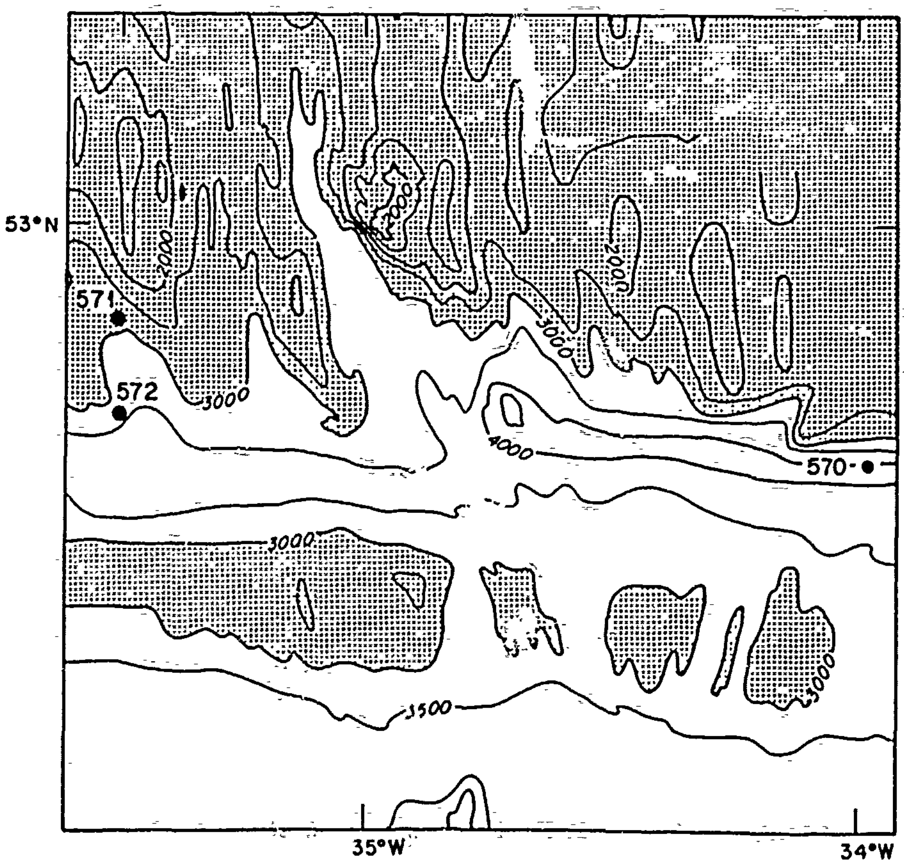
DATA RETURN AND QUALITY

RECORDS FROM ISLAND TRAPPED WAVES EXPERIMENT

Record No.	Inst. depth (m)	Data Dates 1977 - 1978	No. of days	Data presented	Comments
6331	792	Nov.16 - Dec.3	382	T P	Rotor did not work
6332	1092	Nov.16 - Dec.3	382	V T	
6333	1392	Nov.16 - Aug.18/77	275	V T	Clock problems
6334	1692	Nov.16 - Dec.3	382	V T	
6341(T/P)	242	Nov.16 - Dec.16	395	T P	
6342	542	Nov.16 - Dec.16	395	V T	
6343	842	Nov.16 - Dec.16	395	V T	
6351(T/P)	224	Nov.17 - Dec.16	394	T P	
6352	524	Nov.17 - Dec.16	394	V T	
6353	824	Nov.17 - Dec.16	394	T	No rotor data on cassette

All instruments were current meters except where noted (T/P)

V	Velocity component data presented		
P	Pressure	"	"
T	Temperature	"	"



53°N
571
572
2000
3000
2000
2000
3000
4000
570
3000
3000
3500
35°W
34°W

Figure 1

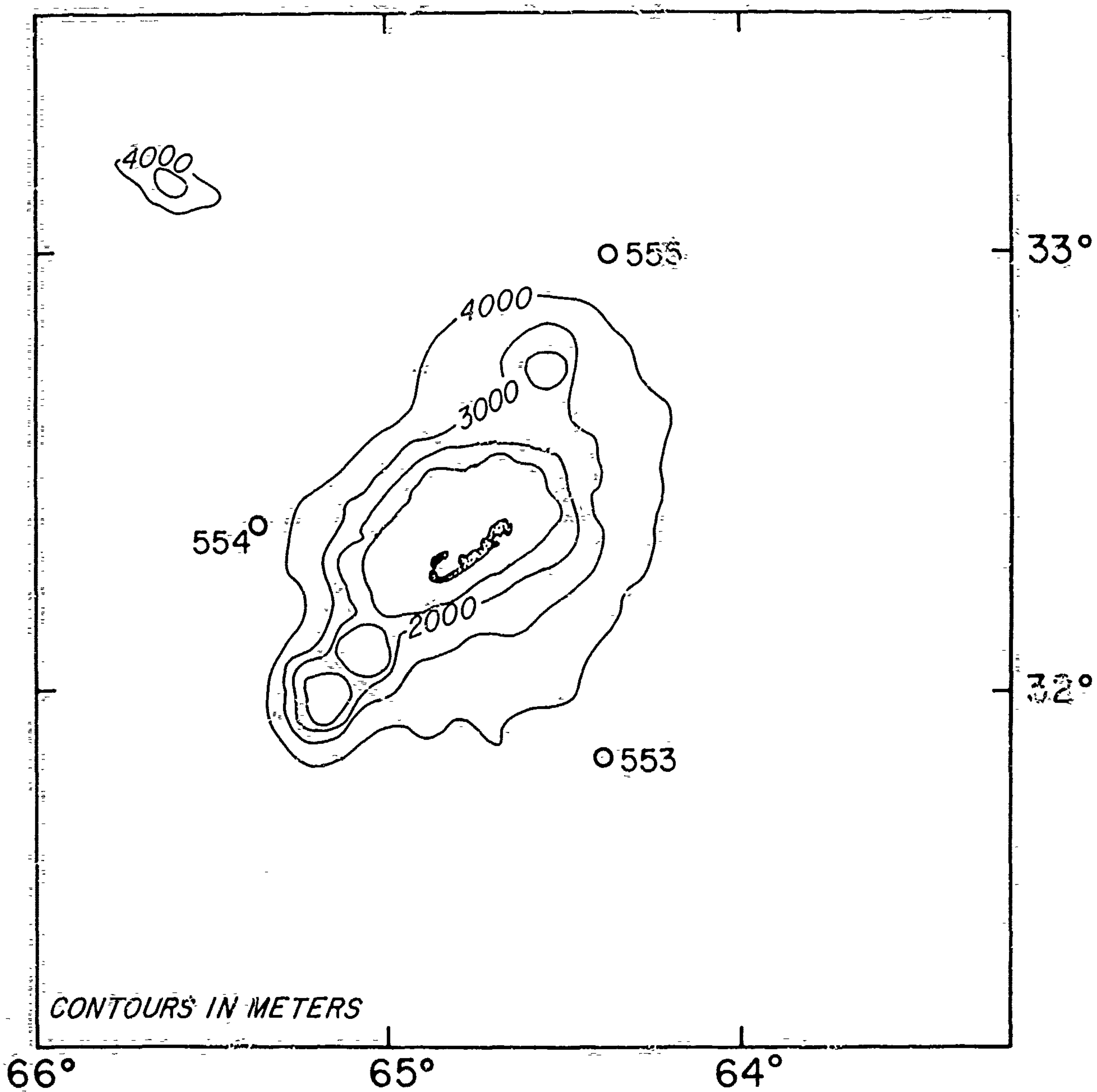

4000
O 555
4000
3000
554O
2000
O553
33°
32°
CONTOURS IN METERS
66°
65°
64°

Figure 2

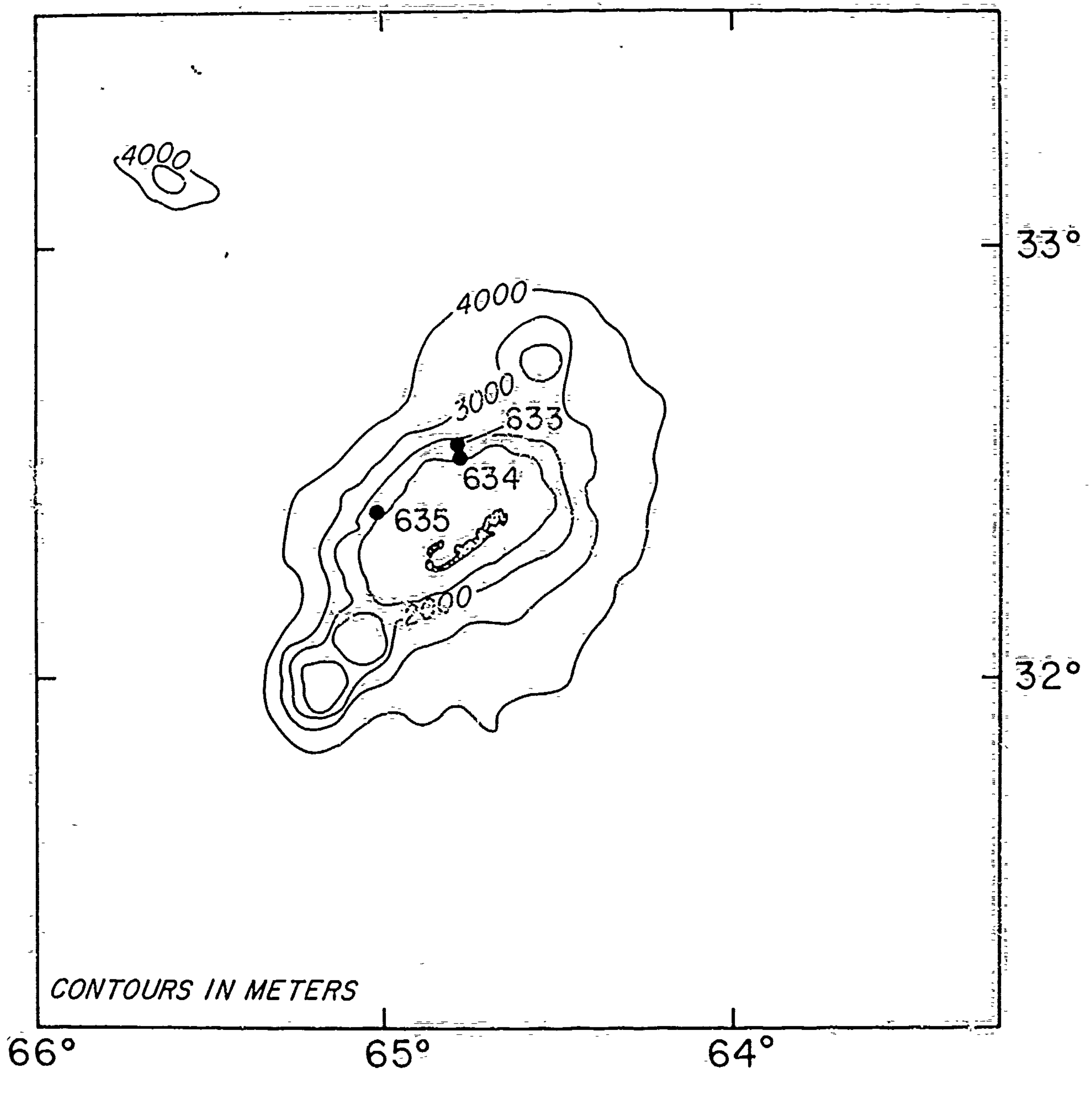

4000
4000
3000
2000
633
634
635
33°
32°
CONTOURS IN METERS
66°
65°
64°

Figure 3

```
5555555555555    7777777777777      0000000           11
5555555555555    777777777777      000000000         111
55               77         77    00       00       1111
55                         77    00         00        11
55                        77     00         00        11
555555555555             77      00         00        11
5555555555555            77      00         00        11
           55           77       00         00        11
           55           77       00         00        11
55         55          77         00       00         11
5555555555555          77          000000000          11
 55555555555           77           0000000           11
```

```
 GGGGGGGGGGG            IIIIIIII            BBBBBBBBBBBB
GGGGGGGGGGGGG           IIIIIIII            BBBBBBBBBBBBB
GG          GG             II               BB          BB
GG          GG             II               BB          BB
GG                         II               BB          BB
GG                         II               BBBBBBBBBBBB
GG      GGGG               II               BBBBBBBBBBBB
GG      GGGGG              II               BB          BB
GG          GG             II               BB          BB
GG         GGG             II               BB          BB
GGGGGGGGGGGGG           IIIIIIII            BBBBBBBBBBBBB
 GGGGGGGGG GG           IIIIIIII            BBBBBBBBBBBB


5555555555555  7777777777777     11       11
5555555555555  7777777777777    111      111
55             77          77  1111     1111
55                        77     11       11
55                       77      11       11
555555555555            77       11       11
5555555555555           77       11       11
           55          77        11       11
           55          77        11       11
55         55         77         11       11
5555555555555         77         11       11
 55555555555          77         11       11
```

```
BBBBBBBBBBBB          SSSSSSSSSSS
BBBBBBBBBBBBB        SSSSSSSSSSSSS
BB          BB       SS          SS
BB          BB       SS
BB          BB       SS
BBBBBBBBBBBB         SSSSSSSSSSSS
BBBBBBBBBBBB          SSSSSSSSSSSS
BB          BB                   SS
BB          BB                   SS
BB          BB       SS          SS
BBBBBBBBBBBBB        SSSSSSSSSSSSS
BBBBBBBBBBBB          SSSSSSSSSSS
```

```
5555555555555   777777777777        11      22222222222
5555555555555   777777777777       111     2222222222222
55              77         77     1111     22          22
55                        77        11                 22
55                       77         11                 22
555555555555            77          11                22
5555555555555           77          11              22
           55          77           11            22
           55          77           11          22
55         55         77            11        22
5555555555555         77            11     2222222222222
 55555555555          77            11     2222222222222
```

```
FFFFFFFFFFFFF        RRRRRRRRRRRR           AAAAAAAAAAA
FFFFFFFFFFFFF        RRRRRRRRRRRRR         AAAAAAAAAAAAA
FF                   RR         RR         AA         AA
FF                   RR         RR         AA         AA
FF                   RR         RR         AA         AA
FFFFFFFF             RRRRRRRRRRRRR         AAAAAAAAAAAAA
FFFFFFFF             RRRRRRRRRRRR          AAAAAAAAAAAAA
FF                   RR      RR            AA         AA
FF                   RR       RR           AA         AA
FF                   RR        RR          AA         AA
FF                   RR        RR          AA         AA
FF                   RR        RR          AA         AA
```

```
5555555555555   7777777777777      11      3333333333
5555555555555   777777777777      111     333333333333
55              77       77      1111     33        33
55                      77         11               33
55                     77          11               33
55555555555           77           11            3333
5555555555555         77           11            3333
           55        77            11               33
           55        77            11               33
55         55       77             11               33
5555555555555       77             11     333333333333
 55555555555        77             11      3333333333
```

```
 CCCCCCCCCC          TTTTTTTTTTTT          UU        UU
CCCCCCCCCCCC         TTTTTTTTTTTT          UU        UU
CC        CC              TT               UU        UU
CC                        TT               UU        UU
CC                        TT               UU        UU
CC                        TT               UU        UU
CC                        TT               UU        UU
CC                        TT               UU        UU
CC                        TT               UU        UU
CC        CC              TT               UU        UU
CCCCCCCCCCCC              TT               UUUUUUUUUUUU
 CCCCCCCCCC               TT                UUUUUUUUUU

555555555555   777777777777    2222222222        11
555555555555   777777777777   222222222222      111
55             77        77   22        22     1111
55                      77              22       11
55                     77               22       11
55555555555           77               22        11
555555555555          77              22         11
          55         77              22          11
          55         77             22           11
55        55        77             22            11
555555555555        77            222222222222   11
 5555555555         77            222222222222   11
```

```
RRRRRRRRRRR                                  EEEEEEEEEEEEE
RRRRRRRRRRRR                                 EEEEEEEEEEEEE
RR         RR                                EE
RR         RR                                EE
RR         RR                                EE
RRRRRRRRRRRRR                                EEEEEEEE
RRRRRRRRRRRR                                 EEEEEEEE
RR      RR                                   EE
RR       RR                                  EE
RR        RR                                 EE
RR        RR                                 EEEEEEEEEEEEE
RR        RR                                 EEEEEEEEEEEEE
```

```
5555555555555    777777777777     22222222222     22222222222
5555555555555    777777777777    2222222222222   2222222222222
55               77        77    22         22   22         22
55                        77               22               22
55                       77                22               22
555555555555            77                22               22
5555555555555           77              22               22
           55          77             22               22
           55          77           22               22
55         55         77          22               22
5555555555555         77         2222222222222   2222222222222
 55555555555          77         2222222222222   2222222222222
```

```
ZZZZZZZZZZZZ      000000000000      NN        NN
ZZZZZZZZZZZZ     00000000000000     NNN       NN
ZZ        ZZ     00          00     NNNN      NN
         ZZ      00          00     NN NN     NN
        ZZ       00          00     NN  NN    NN
       ZZ        00          00     NN   NN   NN
      ZZ         00          00     NN    NN  NN
     ZZ          00          00     NN     NN NN
    ZZ           00          00     NN      NNNN
   ZZ            00          00     NN       NNN
  ZZ        ZZ   00000000000000     NN        NN
ZZZZZZZZZZZZ      000000000000      NN        NN
ZZZZZZZZZZZZ
```

```
5555555555555   7777777777777    22222222222    33333333333
5555555555555   777777777777    2222222222222  3333333333333
55              77        77    22         22  33         33
55                       77                22             33
55                      77                 22             33
555555555555           77                 22            3333
5555555555555          77               22              3333
           55         77              22                  33
           55         77            22                    33
55         55        77           22                      33
5555555555555        77         2222222222222  3333333333333
 55555555555         77         2222222222222   33333333333
```

```
EEEEEEEEEEEEE
EEEEEEEEEEEEE
EE
EE
EE
EEEEEEEE
EEEEEEEE
EE
EE
EE
EEEEEEEEEEEEE
EEEEEEEEEEEEE
```

```
5555555555555    7777777777777      22222222222                44
5555555555555    777777777777     2222222222222               444
55               77       77      22         22              4444
55                       77                  22             44 44
55                      77                   22            44  44
555555555555           77                   22            44   44
5555555555555          77                 22             44    44
           55         77                22              4444444444444
           55         77              22                4444444444444
55         55        77             22                         44
5555555555555        77           2222222222222                44
 55555555555         77           2222222222222                44
```

Table 5

W.H.O.I. Mooring # 570

Charlie-Gibbs Fracture Zone

	Length of item in m.	Mooring Component	Depth in m.	Data Name
1	1	Radio Float	4190	
2	2	1/2" chain		
3	12	12 16" spheres		
4	20	3/16" wire		
5	1.5	VACM	4227	5701
6	13	5/8" Nylon		
7	3	3/8" chain		
8	2	Release	4247	
9	5	1/2" chain		
10	20	5/8" Nylon		
11	3	1/2" chain		
12		Anchor	4288	

Mooring set September 26, 1975

Retrieved June 24, 1976

Days at sea 272

Latitude 52° 42.7'N

Longitude 33° 59.7'W

Table 6

W.H.O.I. Mooring # 571

Charlie-Gibbs Fracture Zone

	Length of item in m.	Mooring Component	Depth in m.	Data Name
1		Radio Float	970	
2	2	1/2" chain		
3	13	13 17" spheres		
4	20	3/16" wire		
5	1.5	VACM	1007	5711
6	1000	3/16" wire		
7	400	3/16" wire		
8	66	3/16" wire		
9	28	5/8" Nylon		
10	8	8 17" spheres		
11	20	3/16" wire		
12	1.5	VACM	2538	5712
13	282	3/16" wire		
14	12	12 17" spheres		
15	1.5	VACM	2835	5713
16	15	5/8" Nylon		
17	3	3/8" chain		
18	2	Release	2857	
19	3	1/2" chain		
20	20	5/8" Nylon		
21	2.5	1/2" chain		
22		Anchors	2895	

Mooring set September 27, 1975

Retrieved June 26, 1976

Days at sea 273

Latitude 52° 53.7'N

Longitude 35° 31.0'W

Table 8

W.H.O.I. Mooring # 553

Bermuda Microstructure Array

	Length of item in m.	Mooring Component	Depth in m.	Data Name
1	1	Radio Float	286	
2	2	1/2" chain		
3	15	3/8" chain, 15 16" spheres		
4	1.5	VACM	306	5531
5	180	3/16" wire		
6	17	3/8" chain		
7	1.5	VACM	506	5532
8	218	3/16" wire		
9	.4	T/P	725	5533
10	258	3/16" wire		
11	18	3/8" chain, 18 16" spheres		
12	1.5	VACM	1005	5534
13	480	3/16" wire		
14	15	3/8" chain, 15 16" spheres		
15	1.5	850 CM	1505	5535
16	3	3/8" chain		
17	2	Release		
18	1193.5	1/4" wire		
19	1000	3/16" wire		
20	400	3/16" wire		
21	177	5/8" Nylon		
22	20	5/8" Nylon		
23	3	1/2" chain		
24		Anchor	4353	

Mooring set April 28, 1975 — Latitude 31° 46.9'N

Retrieved January 26, 1976 — Longitude 64° 26.2'W

Days at sea 273

Table 9

W.H.O.I. Mooring # 554

Bermuda Microstructure Array

	Length of item in m.	Mooring Component	Depth in m.	Data Name
1		Radio Float	294	
2		Light		
3		Radio		
4	2	1/2" chain		
5	15	3/8" chain, 15 16" spheres		
6	1.5	VACM	314	5541
7	180	3/16" wire		
8	17	3/8" chain, 17 16" spheres		
9	1.5	VACM	514	5542
10	218	3/16" wire		
11	14	T/P	733	5543
12	258	3/16" wire		
13	18	3/8" chain, 18 16" spheres		
14	1.5	VACM	1013	5544
15	480	3/16" wire		
16	15	3/8" chain, 15 16" spheres		
17	1.5	850 CM	1513	5545
18	3	3/8" chain		
19	2	Release		
20	1221	1/4" wire		
21	1000	3/16" wire		
22	780	3/16" wire		
23	180	5/8" Nylon		
24	20	5/8" Nylon		
25	3	1/2" chain		
26		Anchor	4774	

Mooring set April 29, 1975

Latitude 32° 21.5'N

Retrieved January 26, 1976

Longitude 65° 27.0'W

Days at sea 272

Table 11

W.H.O.I. Mooring # 633

Island Trapped Waves Experiment

	Length of item in m.	Mooring Component	Depth in m.	Data Name
1		Radio float	565	
		Radio		
		Light		
2	2	1/2" chain		
3	21	21 17" spheres		
4	20	3/16" wire		
5	1.5	VACM	611	6331
6	297	3/16" wire		
7	1.5	VACM	911	6332
8	297	3/16" wire		
9	1.5	VACM	1211	6333
10	259	3/16" wire		
11	17	17 17" spheres		
12	20	3/16" wire		
13	1.5	VACM	1511	6334
14	3	3/8" chain		
15	2	Release		
16	3	3/8" chain		
17	71	3/16" wire		
18	15	5/8" Nylon		
19	2	1/2" chain		
20		Anchor	1611	

Mooring set November 15, 1977 — Latitude 32° 33.8'N

Retrieved December 7, 1978 — Longitude 64° 44.7'W

Days at sea 388

Table 12

W.H.O.I. Mooring # 634

Island Trapped Waves Experiment

	Length of item in m.	Mooring Component	Depth in m.	Data Name
1		Radio Float Radio Light	217	
2	2	1/2" chain		
3	28	28 17" spheres		
4	.4	T/P	242	6341
5	295	3/16" wire		
6	1.5	VACM	542	6342
7	263	3/16" wire		
8	13	13 17" spheres		
9	20	3/16" wire		
10	1.5	VACM	842	6343
11	3	3/8" chain		
12	2	Release		
13	2	3/8" chain		
14	71	3/16" wire		
15	15	5/8" Nylon		
16	2	1/2" chain		
17		Anchor	942	

Mooring set November 16, 1977 Latitude 32° 32.2'N

Retrieved December 16, 1978 Longitude 64° 44.1'W

Days at sea 395

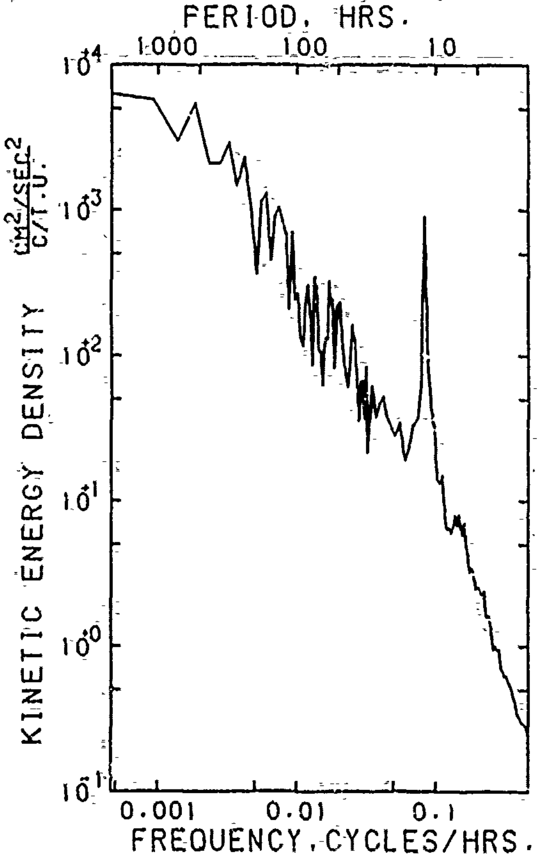
****
** 570161H ** 6502 POINTS FROM 75- IX -27 TO 76- VI -24
INST. V-0129 DEPTH 4227 M.

VARIABLE	*	EAST	NORTH	SPEED	TEMPERATURE1	TEMP. 2
UNITS	*	MM/S	MM/S	MM/S	DEGREES C.	DEG. C.
MEAN	*	-40.584	-5.962	73.349	2.941	2.952
STD. ERR.	*	.908	.302	.589	.714E-3	.711E-3
VARIANCE	*	5357.006	594.362	2253.925	.331E-2	.329E-2
STD. DEV.	*	73.192	24.380	47.476	.575E-1	.573E-1
KURTOSIS	*	2.621	3.545	3.496	3.450	3.431
SKEWNESS	*	-.145	.993E-1	1.011	-.896	-.892
MINIMUM	*	-278.507	-94.496	2.316	2.782	2.793
MAXIMUM	*	183.187	98.115	279.208	3.064	3.074

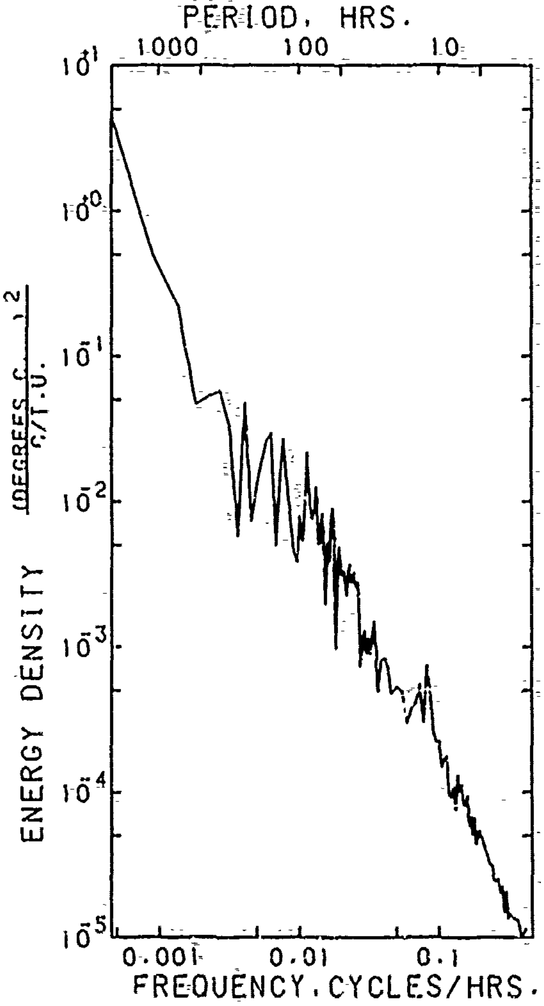
****
EAST & NORTH
****

* DURATION 270.88 DAYS

COVARIANCE	*	-75.696
STD. ERR. OF COVARIANCE	*	27.299
STD. DEV. OF COVARIANCE	*	2201.256
CORRELATION COEFFICIENT	*	-.424E-1
VECTOR MEAN	*	41.020
VECTOR VARIANCE	*	2975.684
VECTOR STD. DEV.	*	54.550



AUTO SPECTRUM
5701B1H EAST
5701B1H NORTH
4227 METERS
75-IX-27 TO 76-VI-23
PIECES WITH 3240 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
5701B1H TEMPERATURE1
4227 METERS
75-IX-27 TO 76-VI-23
1 PIECES WITH 3240 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

** 5711A1H ** 6524 POINTS FROM 75- IX -28 TO 76- VI -26
INST. V-0138 DEPTH 1007 M.

VARIABLE	EAST	NORTH	SPEED	TEMPERATURE
UNITS	MM/S	MM/S	MM/S	DEGREES C.
MEAN	-16.375	-37.509	73.050	3.774
STD. ERR.	.637	.625	.486	.989E-3
VARIANCE	2651.218	2549.869	1539.818	.638E-2
STD. DEV.	51.490	50.496	39.241	.799E-1
KURTOSIS	3.166	2.942	3.328	5.260
SKEWNESS	-.744E-1	-.307	.794	-1.745
MINIMUM	-206.445	-237.379	.227	3.490
MAXIMUM	179.167	100.551	245.435	3.916

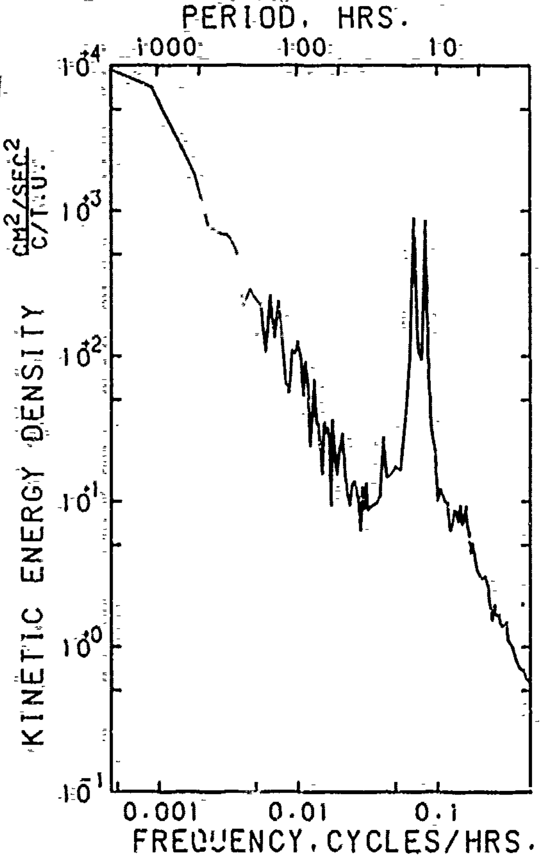
EAST & NORTH

COVARIANCE	-385.914
STD. ERR. OF COVARIANCE	42.683
STD. DEV. OF COVARIANCE	3447.531
CORRELATION COEFFICIENT	-.148
VECTOR MEAN	40.927
VECTOR VARIANCE	2600.543
VECTOR STD. DEV.	50.996

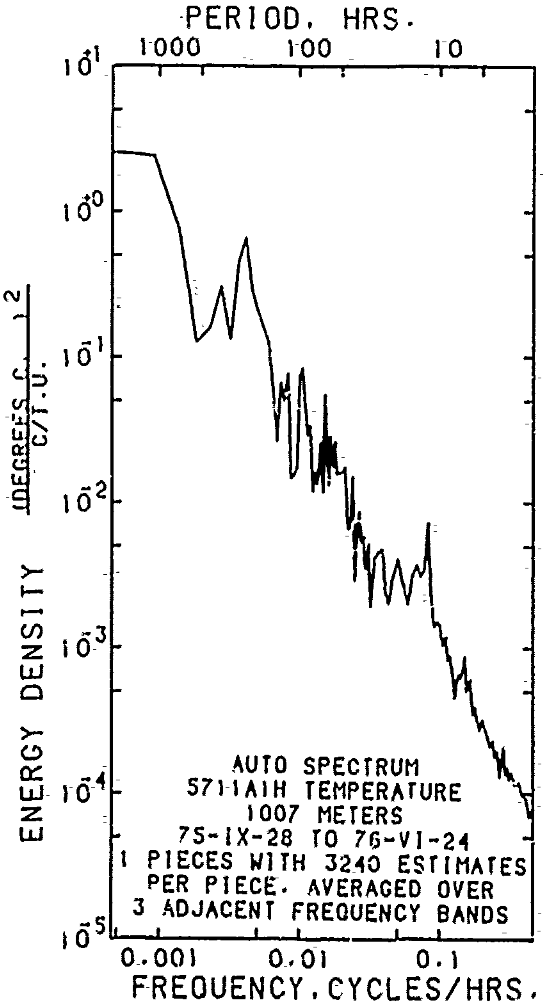
SAMPLE SIZE = 6524 POINTS

SPANNING RANGE
FROM 75- IX -28 08.15.00
TO 76- VI -26 03.15.00

DURATION 271.79 DAYS



AUTO SPECTRUM
5711A1H EAST
5711A1H NORTH
1007 METERS
75-IX-28 TO 76-VI-24
1 PIECES WITH 3240 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
5711A1H TEMPERATURE
1007 METERS
75-IX-28 TO 76-VI-24
1 PIECES WITH 3240 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

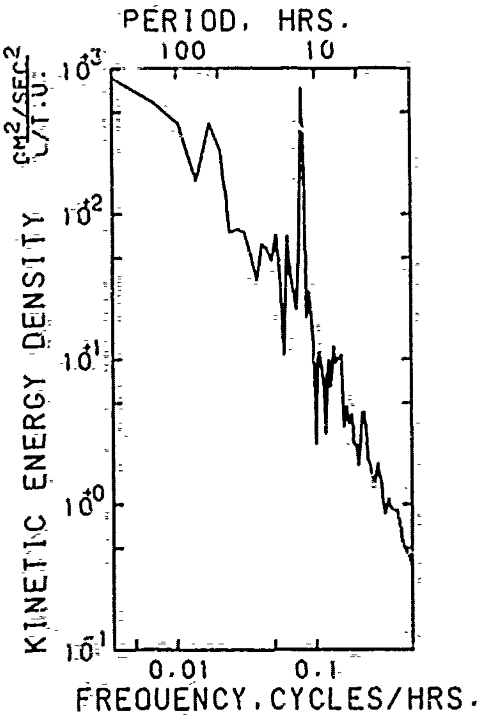
** 5712B1H ** 881 POINTS FROM 75- IX -28 TO 75- XI -04
INST. V-0119 DEPTH 2537 M.

VARIABLE	EAST	NORTH	SPEED	TEMPERATURE
UNITS	MM/S	MM/S	MM/S	DEGREES C.
MEAN	-23.041	-2.303	55.696	3.110
STD. ERR.	1.296	1.474	.969	.587E-3
VARIANCE	1479.226	1913.620	826.985	.304E-3
STD. DEV.	38.461	43.745	28.757	.174E-1
KURTOSIS	3.944	2.956	3.939	2.806
SKEWNESS	.151	-.641E-1	1.034	-.385E-1
MINIMUM	-149.923	-125.253	7.872	3.058
MAXIMUM	152.155	145.070	163.393	3.151

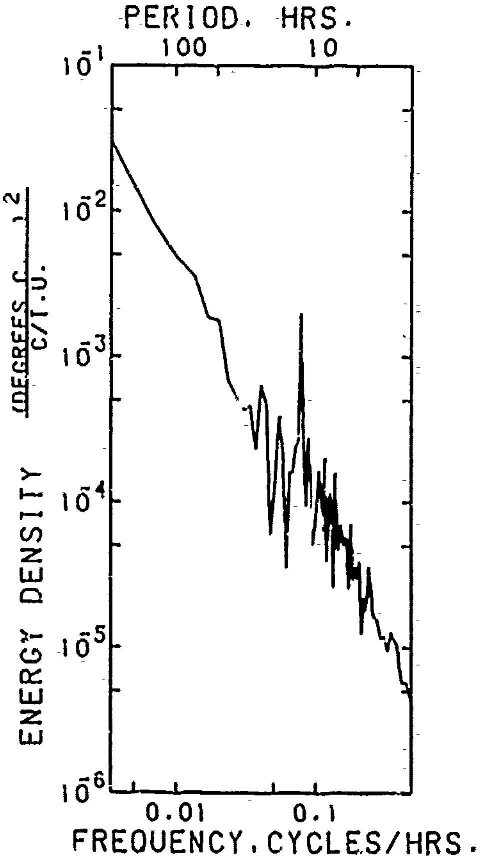
EAST & NORTH

COVARIANCE	-753.837
STD. ERR. OF COVARIANCE	69.214
STD. DEV. OF COVARIANCE	2054.375
CORRELATION COEFFICIENT	-.448
VECTOR MEAN	23.156
VECTOR VARIANCE	1696.423
VECTOR STD. DEV.	41.188

* SAMPLE SIZE = 881 POINTS
* SPANNING RANGE
* FROM 75- IX -28 08.15.00
* TO 75- XI -04 00.15.00
* DURATION 36.67 DAYS



AUTO SPECTRUM
5712B1H EAST
5712B1H NORTH
2537 METERS
75-IX-28 TO 75-XI-03
1 PIECES WITH 432 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
5712B1H TEMPERATURE
2537 METERS
75-IX-28 TO 75-XI-03
1 PIECES WITH 432 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

** 5713B1H 6524 POINTS FROM 75- IX -28 TO 76- VI -26
INST. V-0134 DEPTH 2835 M.

VARIABLE	EAST	NORTH	SPEED	TEMPERATURE
UNITS	MM/S	MM/S	MM/S	DEGREES C.
MEAN	-4.075	7.562	52.562	3.040
STD. ERR.	.468	.563	.353	.535E-3
VARIANCE	1430.352	2071.516	812.933	.187E-2
STD. DEV.	37.820	45.514	28.512	.432E-1
KURTOSIS	3.036	3.016	4.708	2.545
SKEWNESS	-.169	.105	1.105	.133
MINIMUM	-147.772	-145.281	.935	2.894
MAXIMUM	127.018	203.119	229.015	3.169

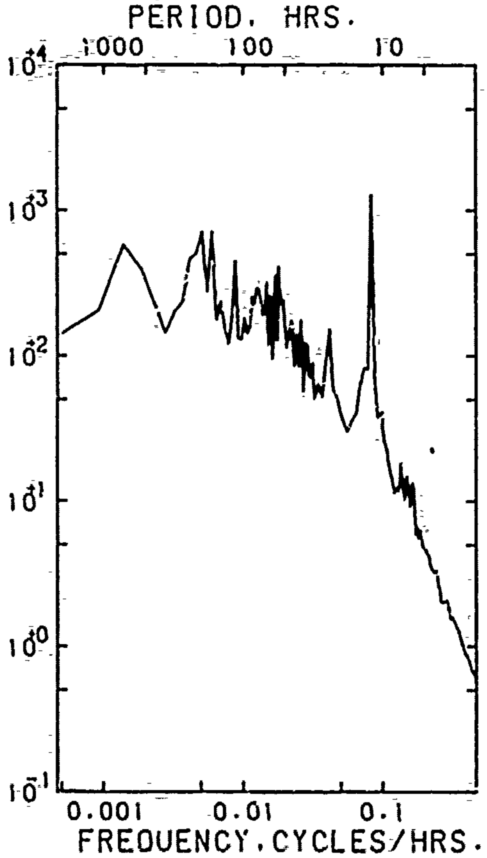
EAST & NORTH

COVARIANCE	-734.709
STD. ERR. OF COVARIANCE	24.724
STD. DEV. OF COVARIANCE	1996.975
CORRELATION COEFFICIENT	-.427
VECTOR MEAN	8.590
VECTOR VARIANCE	1750.934
VECTOR STD. DEV.	41.844

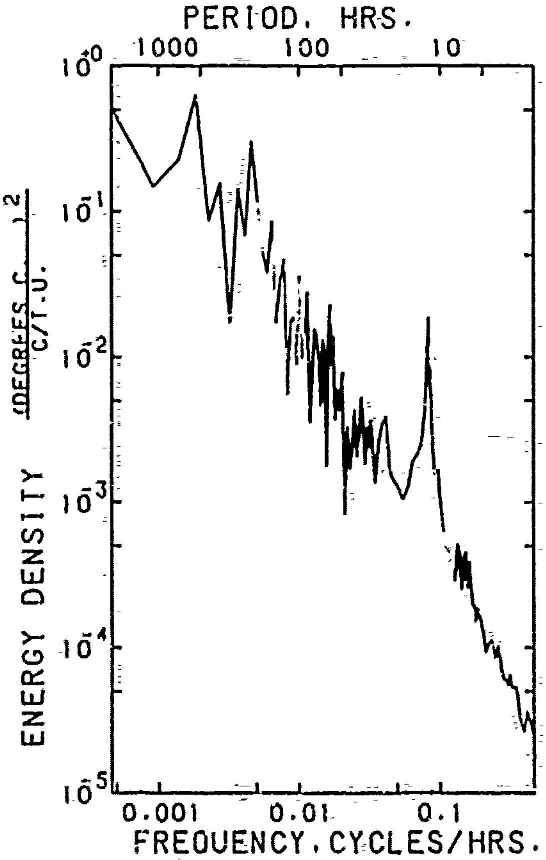
SAMPLE SIZE = 6524 POINTS

SPANNING RANGE
FROM 75- IX -28 08.15.00
TO 76- VI -26 03.15.00

DURATION 271.79 DAYS



AUTO SPECTRUM
5713B1H EAST
5713B1H NORTH
2835 METERS
75-IX-28 TO 76-VI-24
1 PIECES WITH 3240 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
5713B1H TEMPERATURE
2835 METERS
75-IX-28 TO 76-VI-24
1 PIECES WITH 3240 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

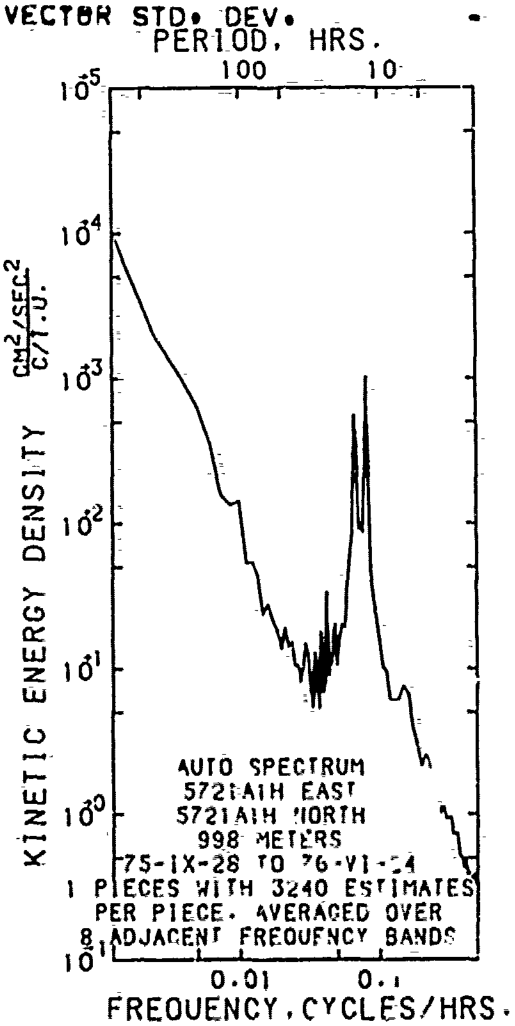
****
** 5721A1H ** 6513 POINTS FROM 75- IX -28 TO 76- VI -25
INST. V-0121 DEPTH 998 M.

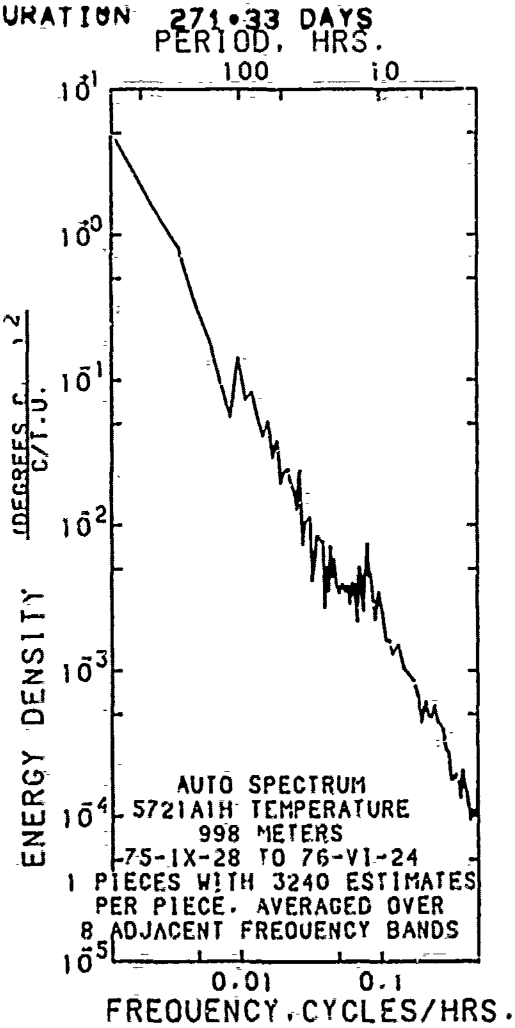
VARIABLE *	EAST	NORTH	SPEED	TEMPERATURE
UNITS *	MM/S	MM/S	MM/S	DEGREES C.
MEAN =	13.691	-32.670	92.499	3.780
STD. ERR. =	.856	.839	.563	.143E-2
VARIANCE =	4775.810	4588.248	2062.712	.133E-1
STD. DEV. =	69.107	67.737	45.417	.115
KURTOSIS =	2.944	2.488	3.383	2.643
SKEWNESS =	.303	-.812E-1	.722	-.954
MINIMUM =	-179.519	-257.229	5.817	3.447
MAXIMUM =	251.435	147.102	288.166	3.981

****
EAST & NORTH
****

COVARIANCE	=	-436.177
STD. ERR. OF COVARIANCE	=	63.617
STD. DEV. OF COVARIANCE	=	5134.116
CORRELATION COEFFICIENT	=	-.932E-1
VECTOR MEAN	=	35.423
VECTOR VARIANCE	=	4682.029
VECTOR STD. DEV.	=	68.425

****
* SAMPLE SIZE = 6513 POINTS
*
* SPANNING RANGE
* FROM 75- IX -28 12.15.00
* TO 76- VI -25 20.15.00
*
* DURATION 271.33 DAYS





** 5722A1H ** 6513 POINTS FROM 75- IX -28 TO 76- VI -25
INST. V-0118 DEPTH 2528 M.

VARIABLE	EAST	NORTH	SPEED	TEMPERATURE
UNITS	MM/S	MM/S	MM/S	DEGREES C.
MEAN	-44.411	-16.346	75.546	3.063
STD. ERR.	.780	.451	.528	.707E-3
VARIANCE	3963.663	1322.965	1818.945	.326E-2
STD. DEV.	62.958	36.373	42.649	.571E-1
KURTOSIS	3.208	3.634	3.151	2.368
SKEWNESS	.180	-.182	.786	.503
MINIMUM	-251.479	-163.498	2.252	2.931
MAXIMUM	209.870	114.455	256.312	3.210

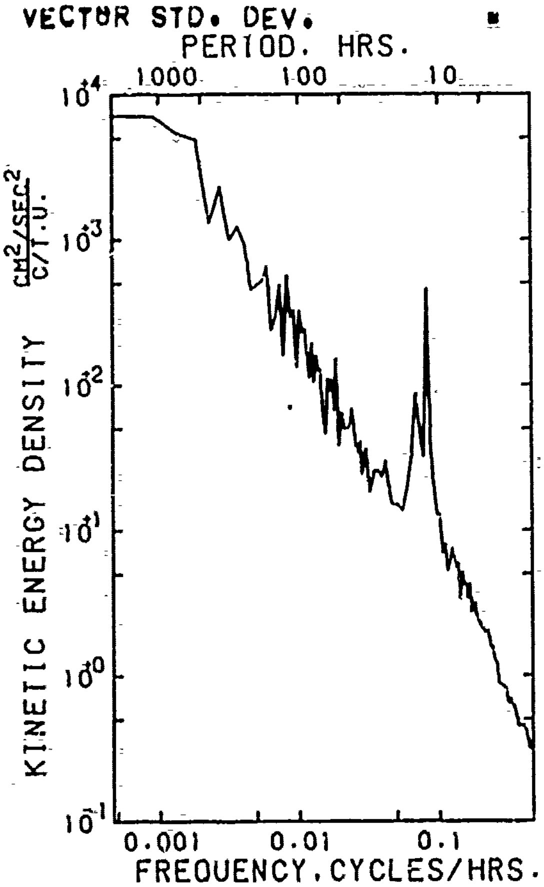
EAST & NORTH

COVARIANCE	=	14.769
STD. ERR. OF COVARIANCE	=	39.422
STD. DEV. OF COVARIANCE	=	3181.442
CORRELATION COEFFICIENT	=	.645E-2
VECTOR MEAN	=	47.323
VECTOR VARIANCE	=	2643.314
VECTOR STD. DEV.	=	51.413

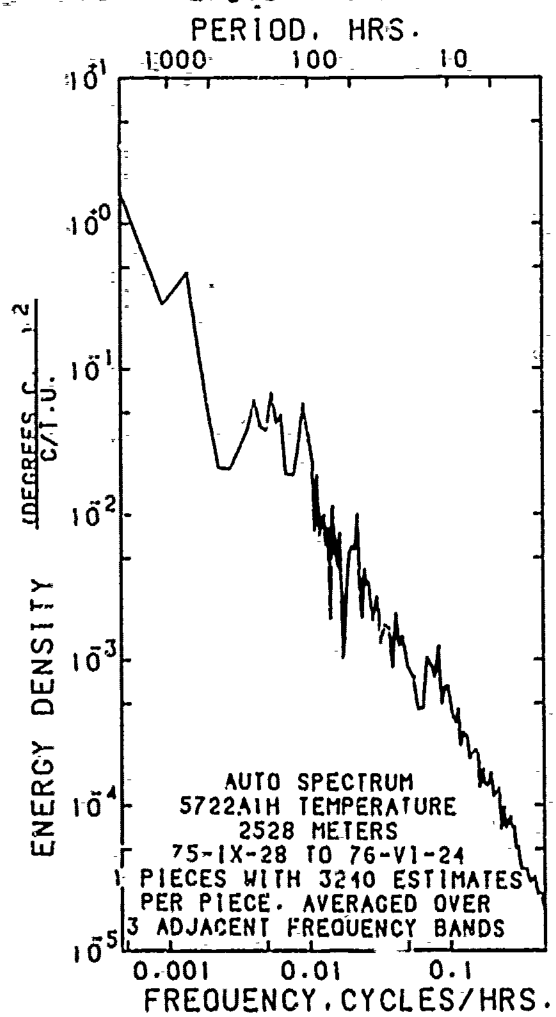
SAMPLE SIZE = 6513 POINTS

SPANNING RANGE
FROM 75- IX -28 12.15.00
TO 76- VI -25 20.15.00

DURATION 271.33 DAYS



AUTO SPECTRUM
5722A1H EAST
5722A1H NORTH
2528 METERS
75-IX-28 TO 76-VI-24
1 PIECES WITH 3240 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
5722A1H TEMPERATURE
2528 METERS
75-IX-28 TO 76-VI-24
1 PIECES WITH 3240 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

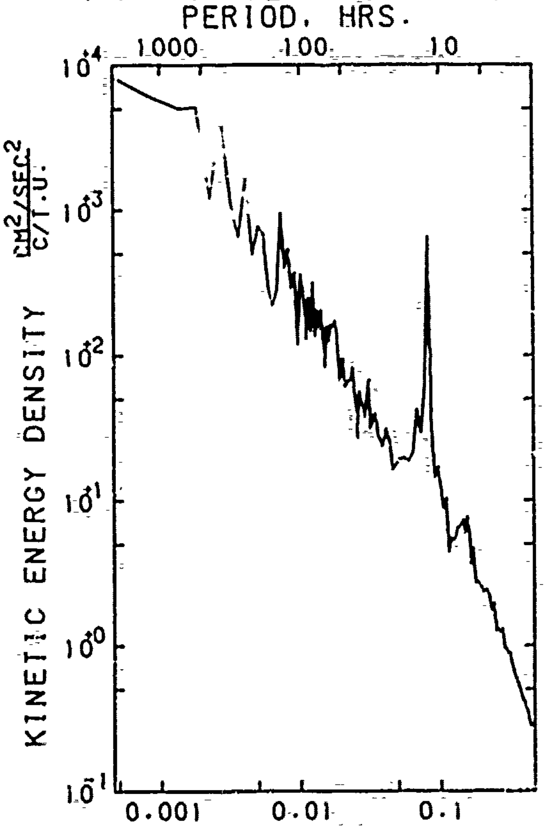
****
**/ 5723A1H ** 6513 POINTS FROM 75- IX -28 TO 76- VI -25
INST. V-0165 DEPTH 3060 M.

VARIABLE *	EAST	NORTH	SPEED	TEMPERATURE
UNITS *	MM/S	MM/S	MM/S	DEGREES C.
MEAN =	-38.224	-9.954	75.939	2.970
STD. ERR. =	.875	.402	.530	.593E-3
VARIANCE =	4986.988	1050.807	1831.284	.229E-2
STD. DEV. =	70.619	32.416	42.793	.479E-1
KURTOSIS =	2.887	3.310	3.937	2.984
SKEWNESS =	.883E-1	-.436E-1	1.033	-.525
MINIMUM =	-269.454	-122.792	1.992	2.814
MAXIMUM =	192.233	123.886	274.712	3.086

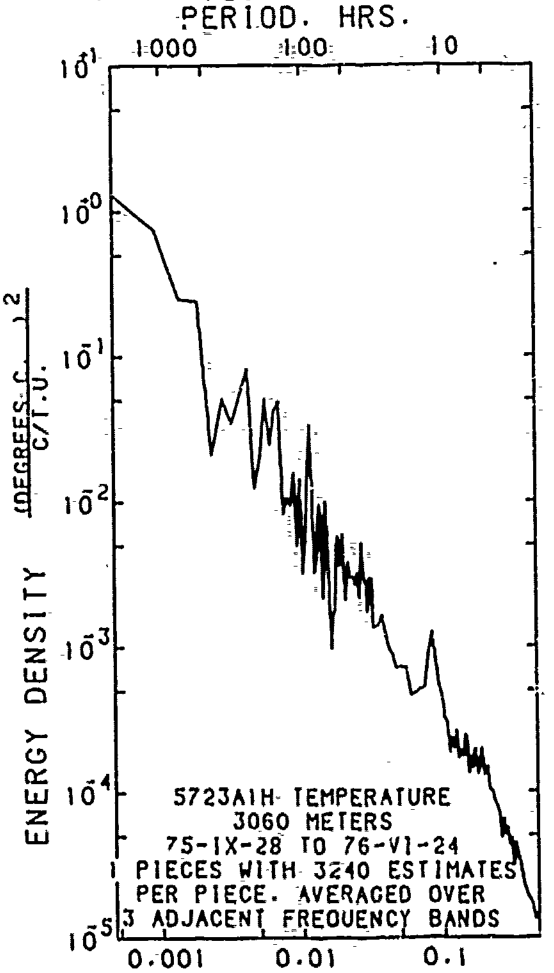
****
EAST & NORTH
****

COVARIANCE	=	476.658
STD. ERR. OF COVARIANCE	=	34.720
STD. DEV. OF COVARIANCE	=	2802.004
CORRELATION COEFFICIENT	=	.208
VECTOR MEAN	=	39.499
VECTOR VARIANCE	=	3018.897
VECTOR STD. DEV.	=	54.944

****
* SAMPLE SIZE = 6513 POINTS
*
* SPANNING RANGE
* FROM 75- IX -28 12.15.00
* TO 76- VI -25 20.15.00
*
* DURATION 271.33 DAYS



AUTO SPECTRUM
5723A1H EAST
5723A1H NORTH
3060 METERS
75-IX-28 TO 76-VI-24
1 PIECES WITH 3240 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS



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** 5724A1H ** 6513 POINTS FROM 75- IX -28 TO 76- VI -25

INST. V-0161 DEPTH 3360 M.

VARIABLE	EAST	NORTH	SPEED	TEMPERATURE
UNITS	MM/S	MM/S	MM/S	DEGREES C.
MEAN	-31.957	-20.992	76.187	2.904
STD. ERR.	.825	.548	.561	.111E-2
VARIANCE	4434.251	1955.429	2047.116	.807E-2
STD. DEV.	66.590	44.220	45.245	.899E-1
KURTOSIS	3.360	4.452	3.873	2.426
SKEWNESS	-.507E-2	-.764	1.030	-.631
MINIMUM	-266.978	-250.028	1.113	2.634
MAXIMUM	185.841	93.151	285.211	3.040

****

EAST & NORTH

****

COVARIANCE	600.467
STD. ERR. OF COVARIANCE	43.489
STD. DEV. OF COVARIANCE	3509.719
CORRELATION COEFFICIENT	.204
VECTOR MEAN	38.235
VECTOR VARIANCE	3194.840
VECTOR STD. DEV.	56.523

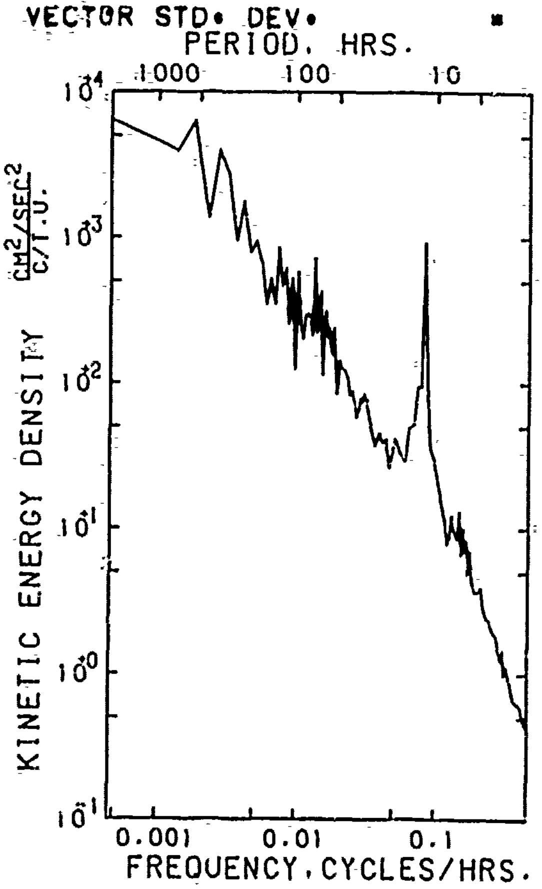
* SAMPLE SIZE = 6513 POINTS

* SPANNING RANGE

* FROM 75- IX -28 12.15.00

* TO 76- VI -25 20.15.00

* DURATION 271.33 DAYS



AUTO SPECTRUM
5724A1H EAST
5724A1H NORTH
3360 METERS
75-IX-28 TO 76-VI-24
1 PIECES WITH 3240 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

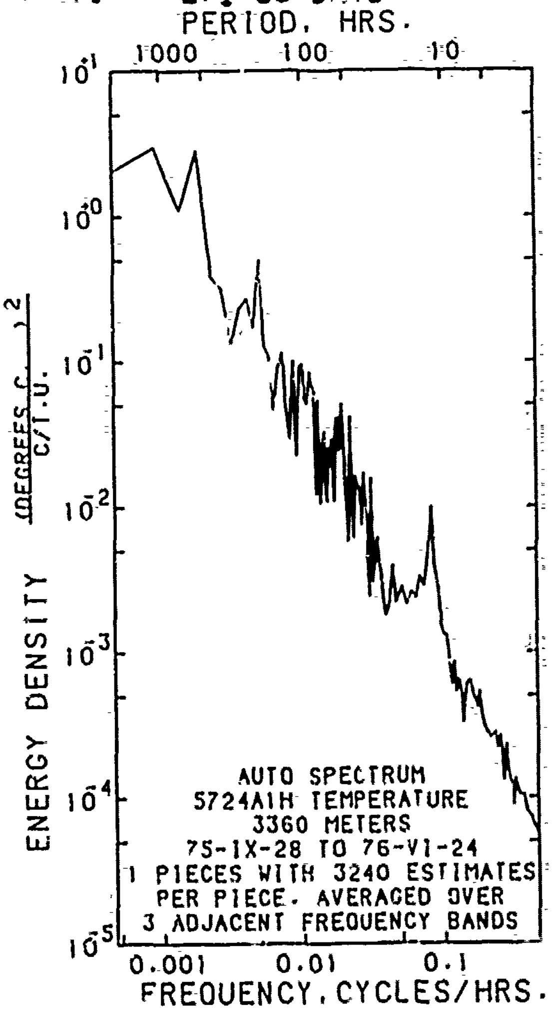


Table 7

W.H.O.I. Mooring # 572

Charlie-Gibbs Fracture Zone

	Length of item in m.	Mooring Component	Depth in m.	Data Name
1		Radio Float	956	
2	2	1/2" chain		
3	16	16 16" spheres		
4	20	3/16" wire		
5	1.5	VACM	997	5721
6	1000	3/16" wire		
7		Milliman sample		
8		Milliman sample		
9		Milliman sample		
10	400	3/16" wire		
11		Milliman sample		
12	79	3/16" wire		
13	13.5	5/8" Nylon		
14	11	11 16" spheres		
15	20	3/16" wire		
16	1.5	VACM	2528	5722
17	500	3/16" wire		
18		Milliman sample		
19	8	8 16" spheres		
20	20	3/16" wire		
21	1.5	VACM	3060	5723
22	269	3/16" wire		
23	17	17 16" spheres		
24	10	3/16" wire		
25	1.5	VACM	3359	5724
26	13	5/8" Nylon		
27		Milliman sample		
28	5	3/8" chain		
29	2	Release		
30	3	1/2" chain		
31	20	5/8" Nylon		
32	2.5	1/2" chain		
33		Anchors	3398	

Mooring Set September 27, 1975 Latitude 52° 46.1'N

Retrieved June 25, 1976 Longitude 35° 30.0'W

Days at sea 273

CURRENT ROSES FOR NEAR BOTTOM INSTRUMENTS

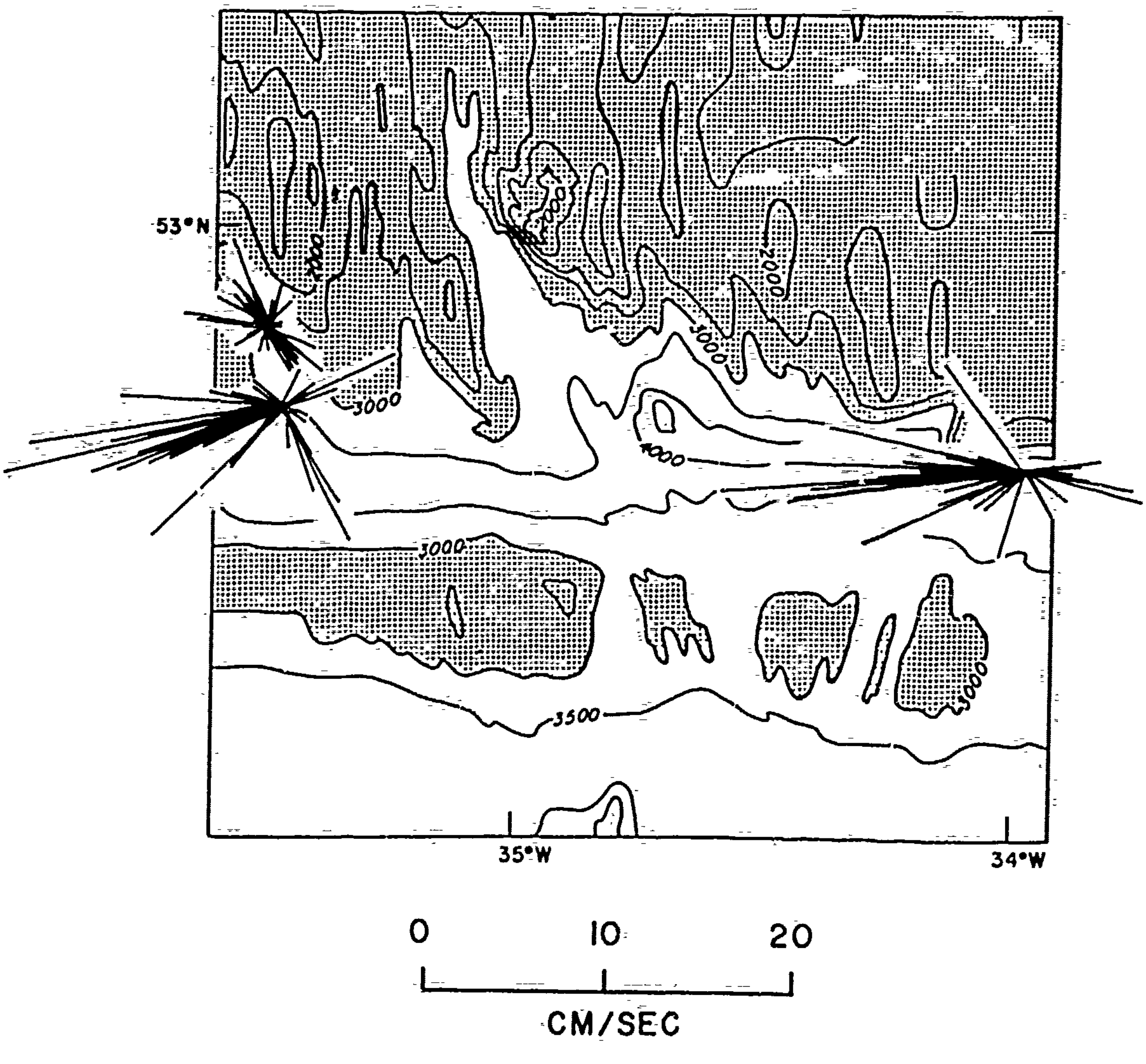


Figure 4

Table 10

W.H.O.I. Mooring # 555

Bermuda Microstructure Array

	Length of item in m.	Mooring Component	Depth in m.	Data Name
1		Teardrop Float	297	
2		Radio		
3		Light		
4	2	3/8" chain		
5	15	3/8" chain, 15 16" spheres		
6	1.5	VACM	316	5551
7	182	Wire		
8	15	3/8" chain, 15 16" spheres		
9	1.5	VACM	516	5552
10	218	3/16" wire		
11	.4	T/P	736	5553
12	28	3/16" wire		
13	1.5	VACM	766	5554
14	237	3/16" wire		
15	10	3/18" chain, 10 16" spheres		
16	1.5	VACM	1016	5555
17	480	3/16" wire		
18	15	3/8" chain, 15 16" spheres		
19	1.5	850 CM	1516	5556
20	1000	3/16" wire		
21	1000	3/16" wire		
22	478	3/16" wire		
23	5	3/8" chain, 5 16" spheres		
24	1.5	850 CM	4016	5557
25	200	3/16" wire		
26	20	3/16" wire		
27	50	3/16" wire		
28	100	3/16" wire		
29	76	5/8" Nylon		
30	15	3/8" chain, 15 16" spheres		
31	2	Release		
32	5	1/2" chain		
33	20	5/8" Nylon		
34	3	1/2" chain		
35		Anchor	4527	

Mooring Set April 29, 1975

Latitude 32° 59'N

Retrieved January 25, 1976

Longitude 64° 23.8'W

Days at sea 271

CURRENT ROSES AT A NOMINAL DEPTH OF 1500 M

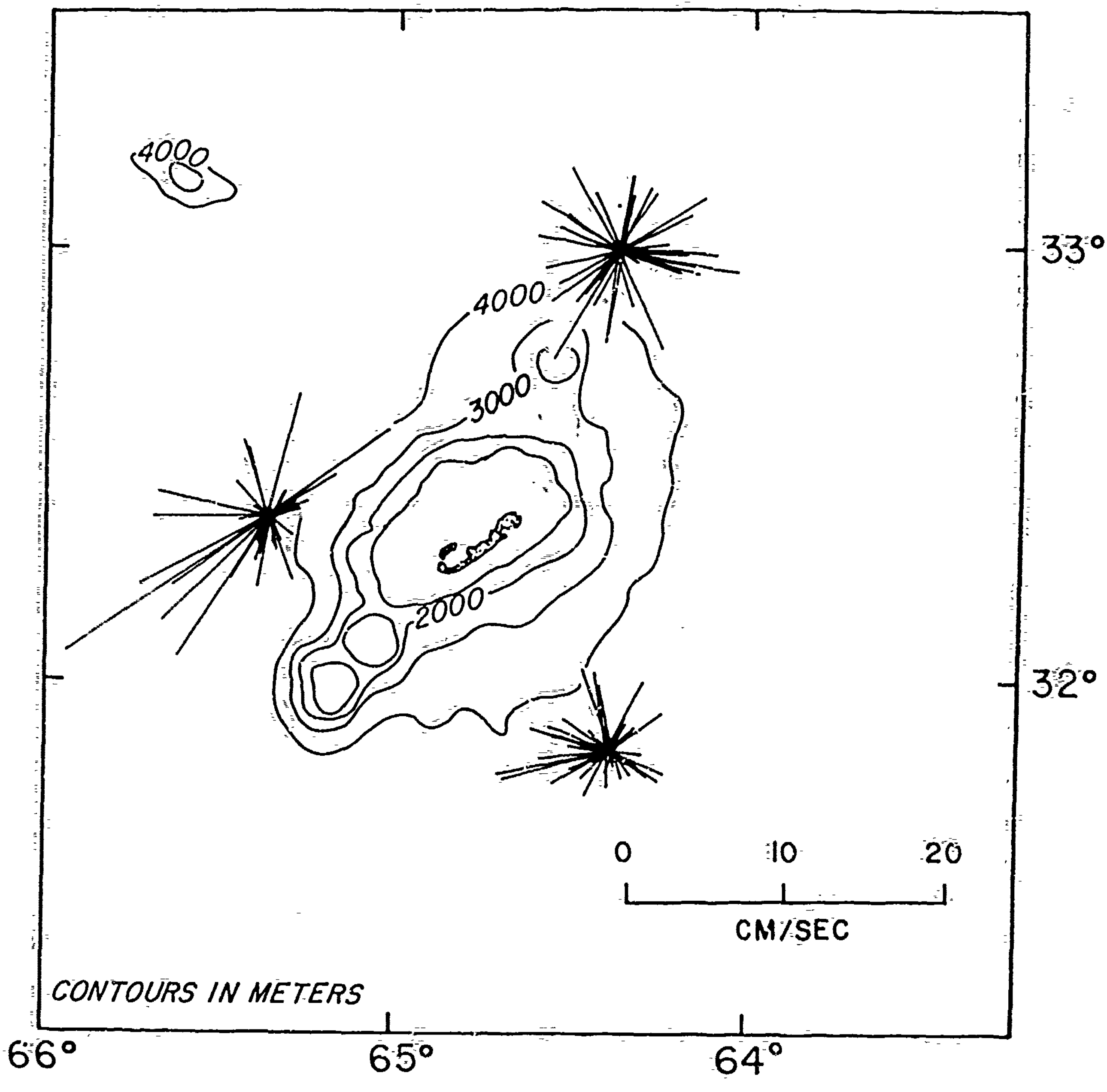


Figure 5

Table 13

W.H.O.I. Mooring # 635

Island Trapped Waves Experiment

	Length of item in m.	Mooring Component	Depth in m.	Data Name
1		Radio Float Radio Light	199	
2	2	1/2" chain		
3	28	28 17" spheres		
4	.4	T/P	224	6351
5	295	3/16" wire		
6	1.5	VACM	524	6352
7	263	3/16" wire		
8	13	13 17" spheres		
9	20	3/16" wire		
10	1.5	VACM	824	6353
11	3	3/8" chain		
12	2	Release		
13	3	3/8" chain		
14	71	3/16" wire		
15	15	5/8" Nylon		
16	2	1/2" chain		
17		Anchors	924	

Mooring set November 17, 1977 | Latitude 32° 22.4'N

Retrieved December 17, 1978 | Longitude 65° 00.9'W

Days at sea 395

CURRENT ROSES AT A NOMINAL DEPTH OF 500 M

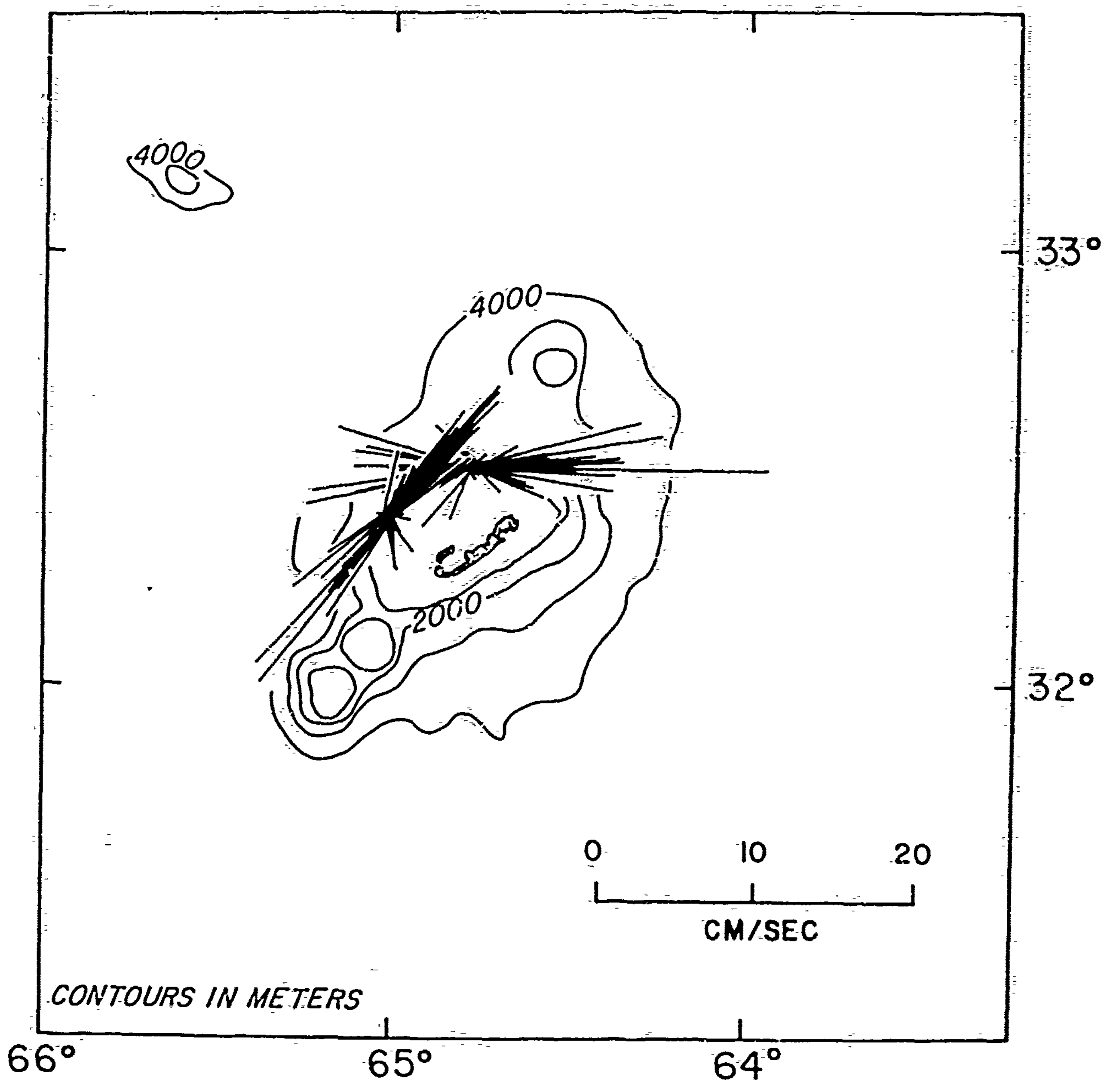
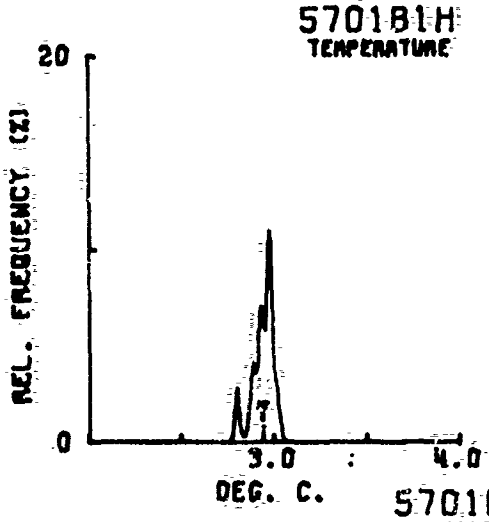
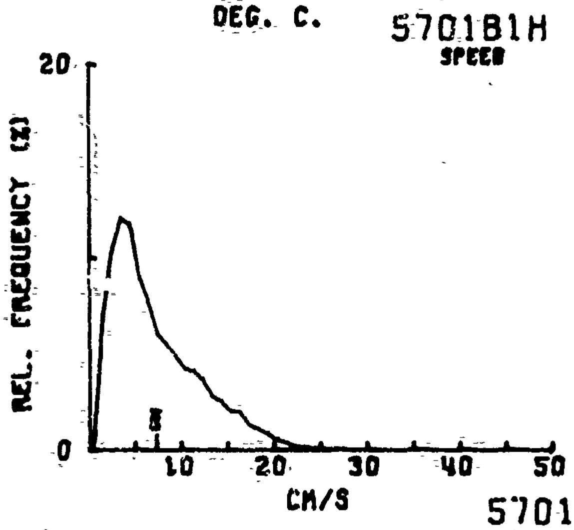
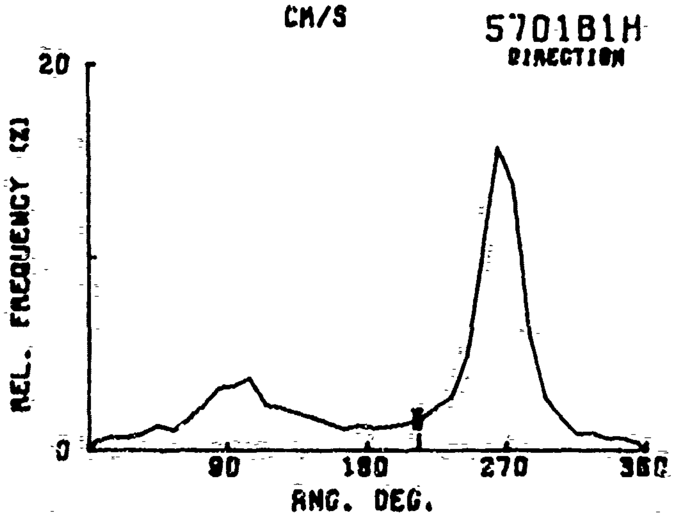
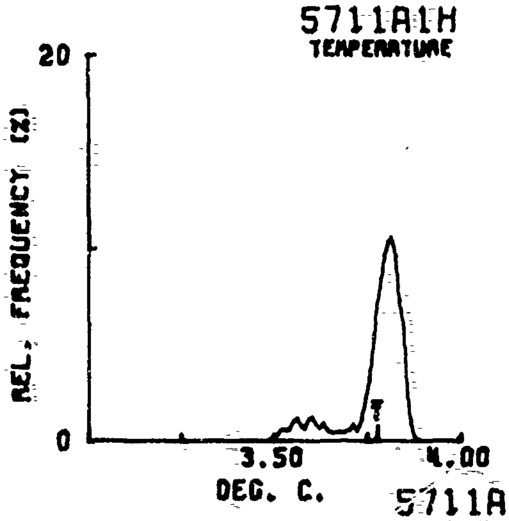


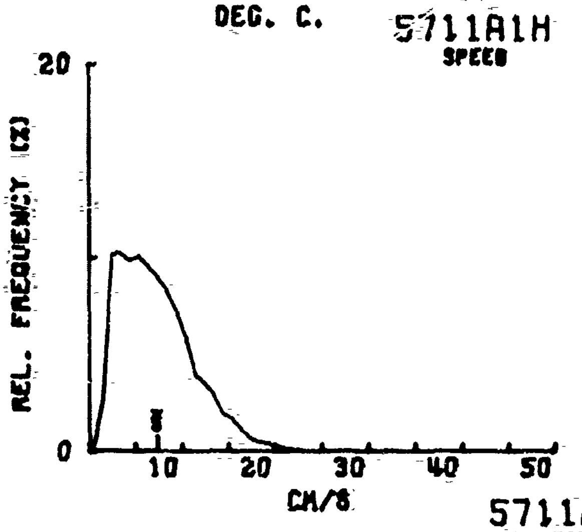
Figure 6

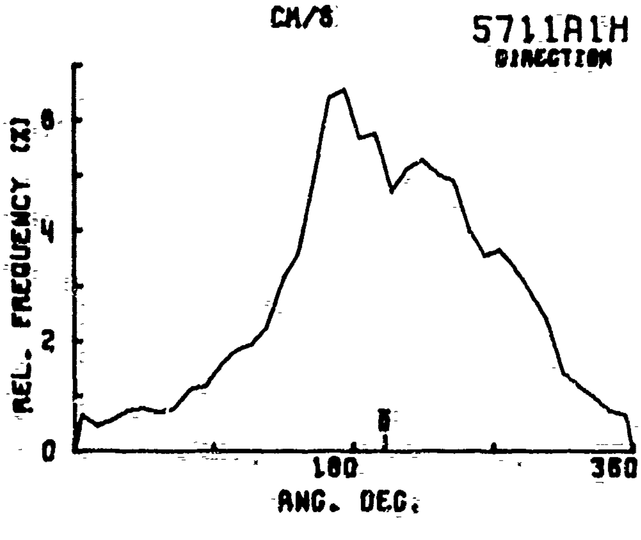

5701B1H
TEMPERATURE
20
REL. FREQUENCY (%)
0
3.0
4.0
DEG. C.

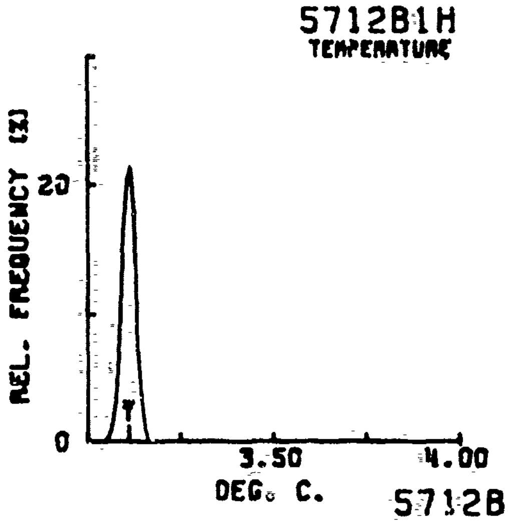

5701B1H
SPEED
20
REL. FREQUENCY (%)
0
10
20
30
40
50
CM/S

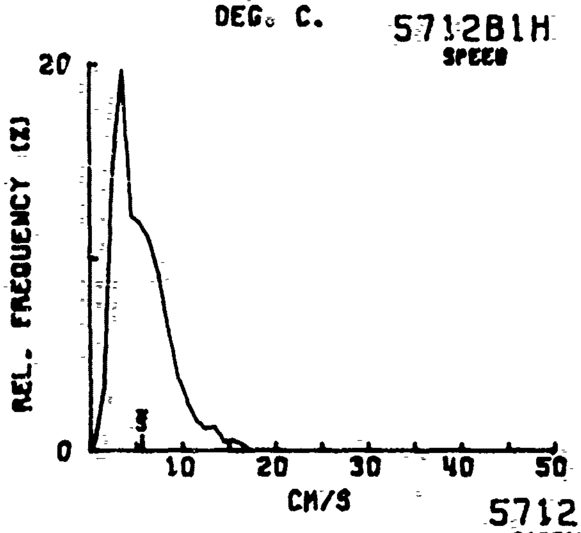

5701B1H
DIRECTION
20
REL. FREQUENCY (%)
0
90
180
270
360
ANG. DEG.

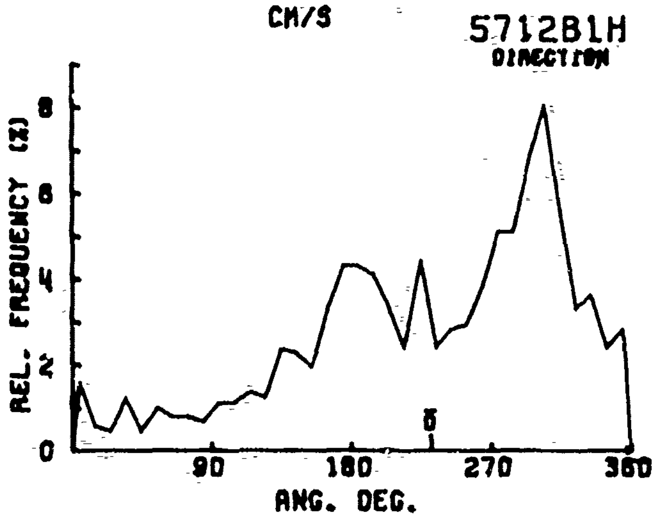

5711A1H
TEMPERATURE
20
REL. FREQUENCY (%)
0
3.50
4.00
DEG. C.

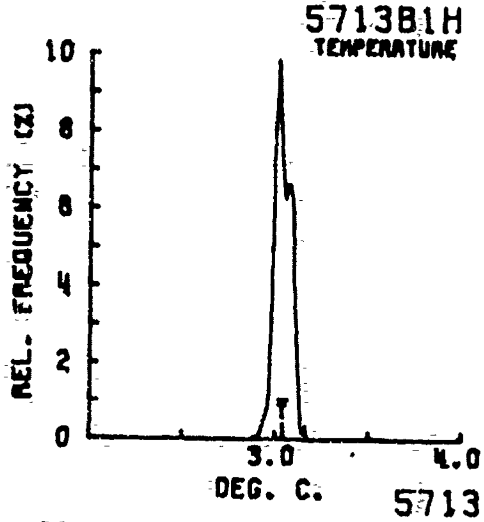

5711A1H
SPEED
20
REL. FREQUENCY (%)
0
10
20
30
40
50
CM/S

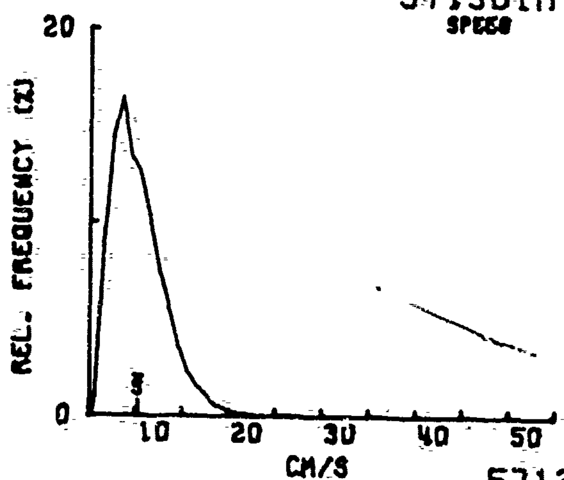

5711A1H
DIRECTION
6
4
2
0
REL. FREQUENCY (%)
180
360
ANG. DEG.

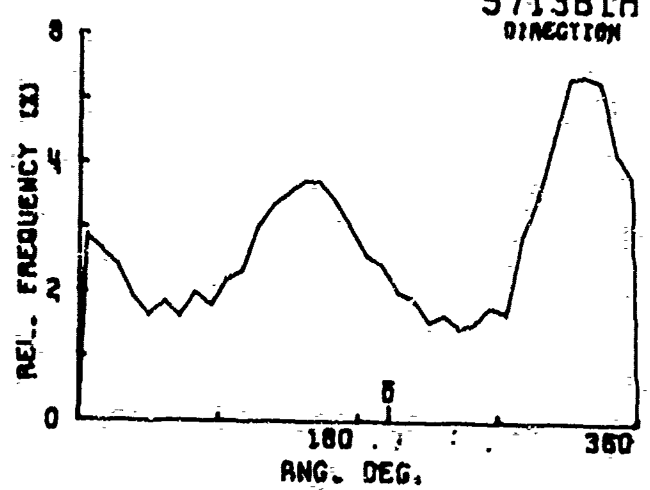

5712B1H
TEMPERATURE
REL. FREQUENCY (%)
20
0
3.50
4.00
DEG. C.

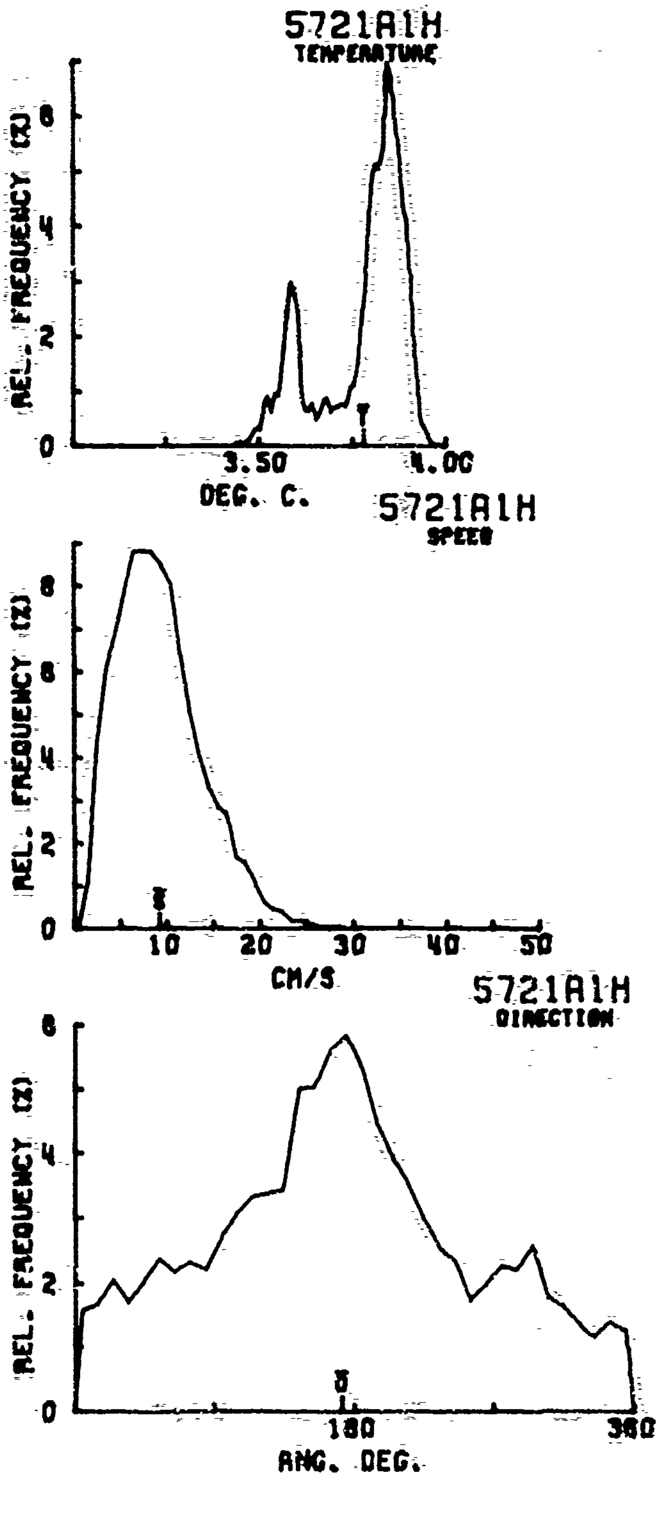

5712B1H
SPEED
REL. FREQUENCY (%)
20
0
10
20
30
40
50
CM/S


5712B1H
DIRECTION
REL. FREQUENCY (%)
8
6
4
2
0
90
180
270
360
ANG. DEG.

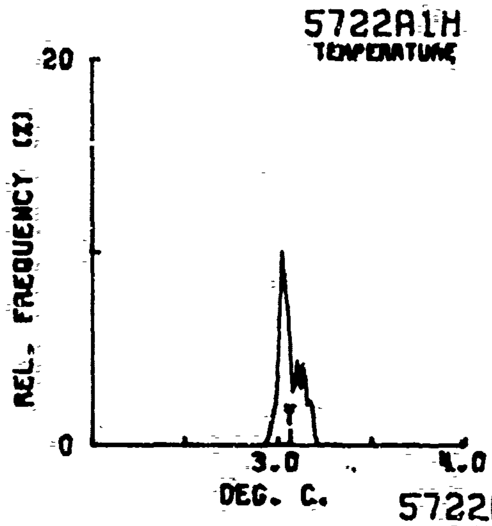

5713B1H
TEMPERATURE
REL. FREQUENCY (%)
0
2
4
6
8
10
3.0
4.0
DEG. C.

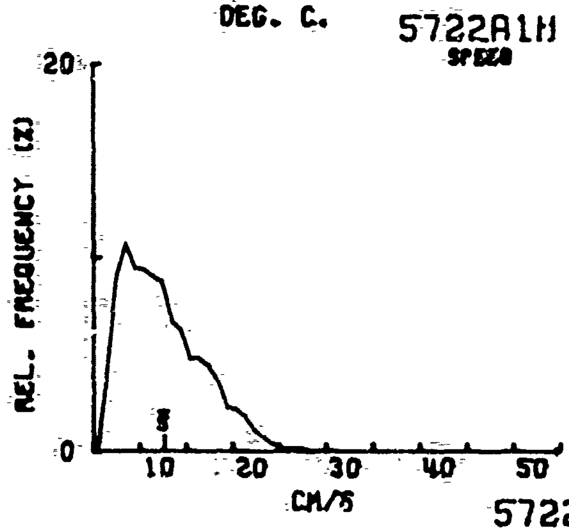

5713B1H
SPEED
REL. FREQUENCY (%)
0
20
10
20
30
40
50
CM/S

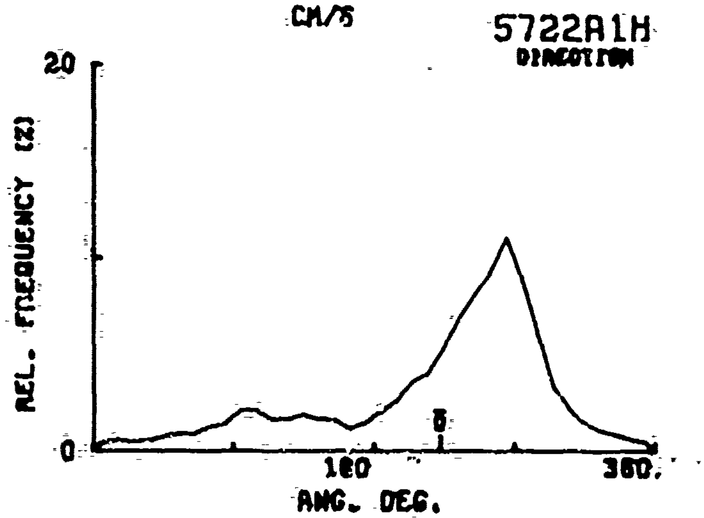

5713B1H
DIRECTION
REL. FREQUENCY (%)
0
2
4
8
180
360
ANG. DEG.

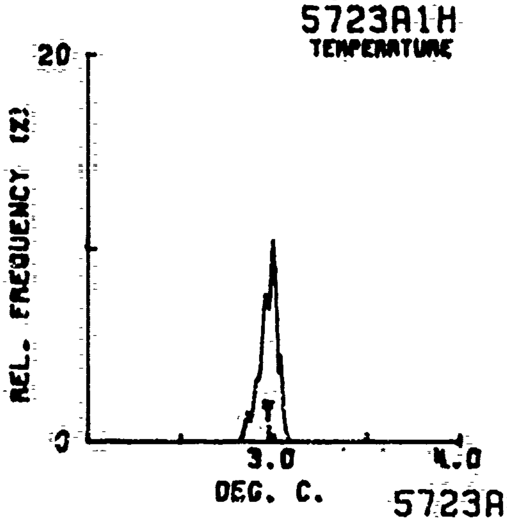


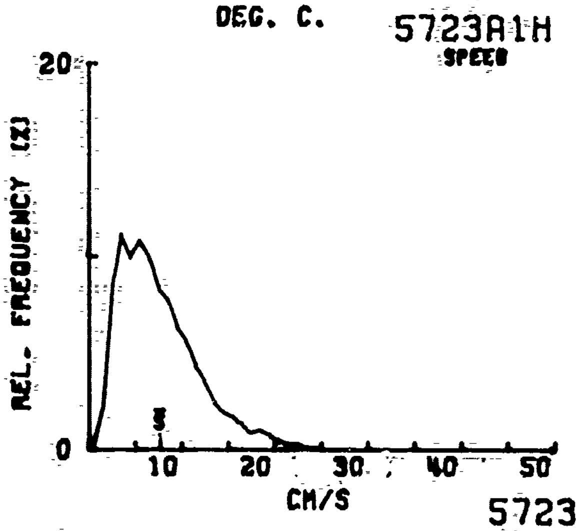
5721A1H
TEMPERATURE
REL. FREQUENCY (%)
0
2
4
6
3.50
4.00
DEG. C.
5721A1H
SPEED
REL. FREQUENCY (%)
0
2
4
6
8
10
20
30
40
50
CM/S
5721A1H
DIRECTION
REL. FREQUENCY (%)
0
2
4
6
180
360
ANG. DEG.

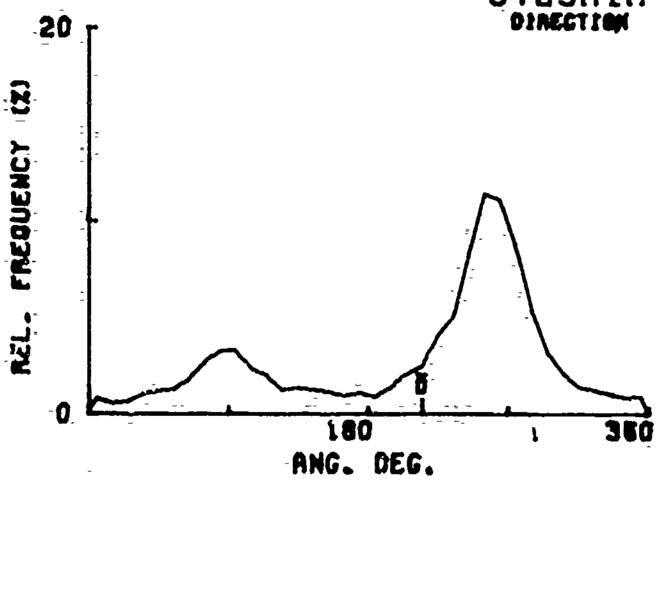

5722A1H
TEMPERATURE
20
0
REL. FREQUENCY (%)
3.0
4.0
DEG. C.

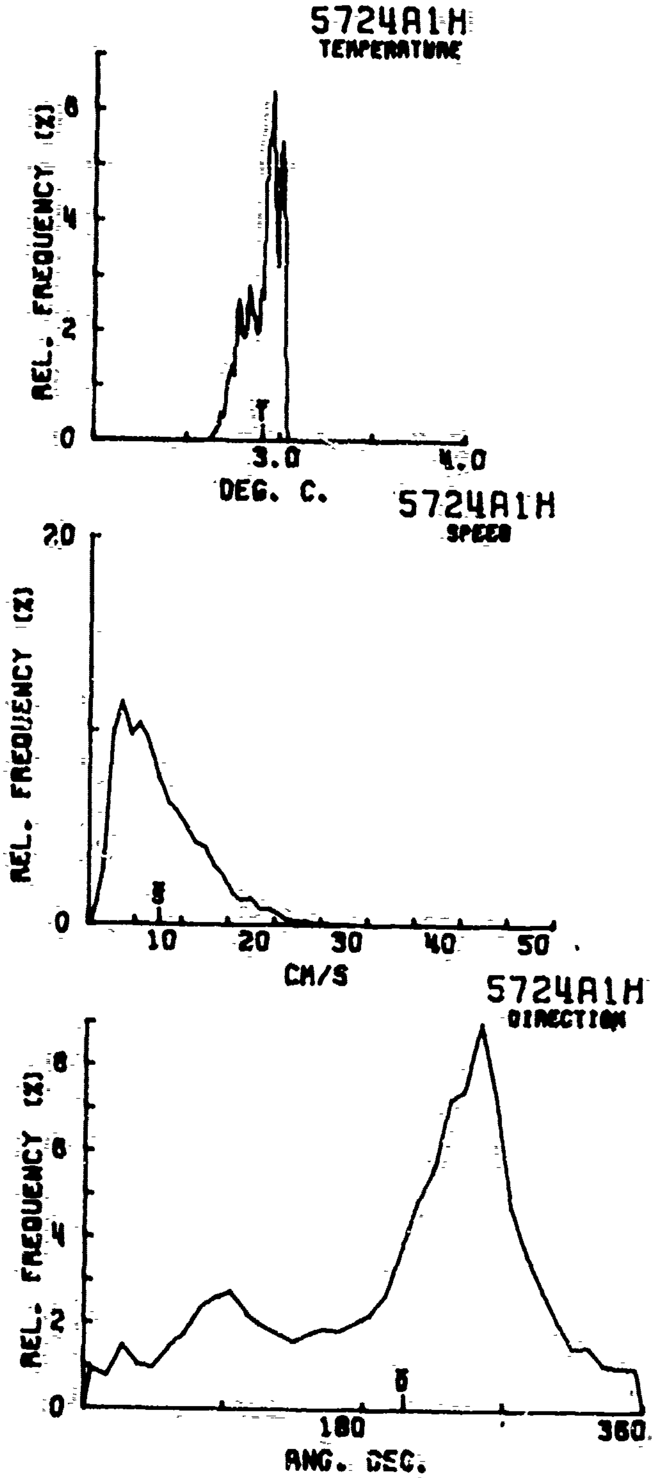

5722A1H
SPEED
20
0
REL. FREQUENCY (%)
10
20
30
40
50
CM/S


5722A1H
DIRECTION
20
0
REL. FREQUENCY (%)
180
360.
ANG. DEG.


5723A1H
TEMPERATURE
20
REL. FREQUENCY (%)
0
T
3.0
4.0
DEG. C.


5723A1H
SPEED
20
REL. FREQUENCY (%)
0
S
10
20
30
40
50
CM/S


5723A1H
DIRECTION
20
REL. FREQUENCY (%)
0
D
180
360
ANG. DEG.


5724A1H
TEMPERATURE
REL. FREQUENCY (%)
0
2
4
6
3.0
4.0
DEG. C.
5724A1H
SPEED
REL. FREQUENCY (%)
20
0
10
20
30
40
50
CM/S
5724A1H
DIRECTION
REL. FREQUENCY (%)
0
2
4
6
8
180
360
ANG. DEG.

CURRENT VECTORS FOR MOORING 553

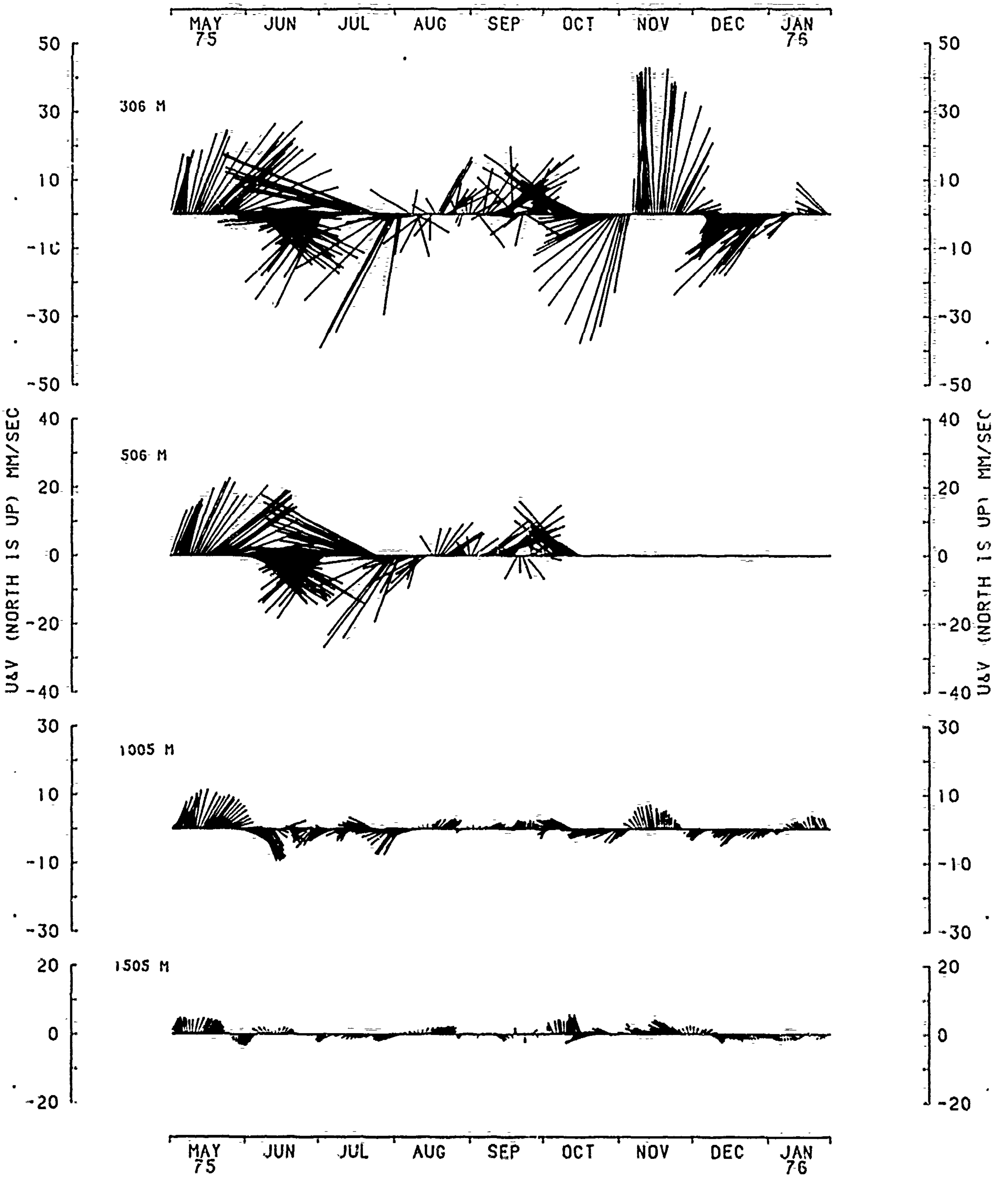


Figure 13

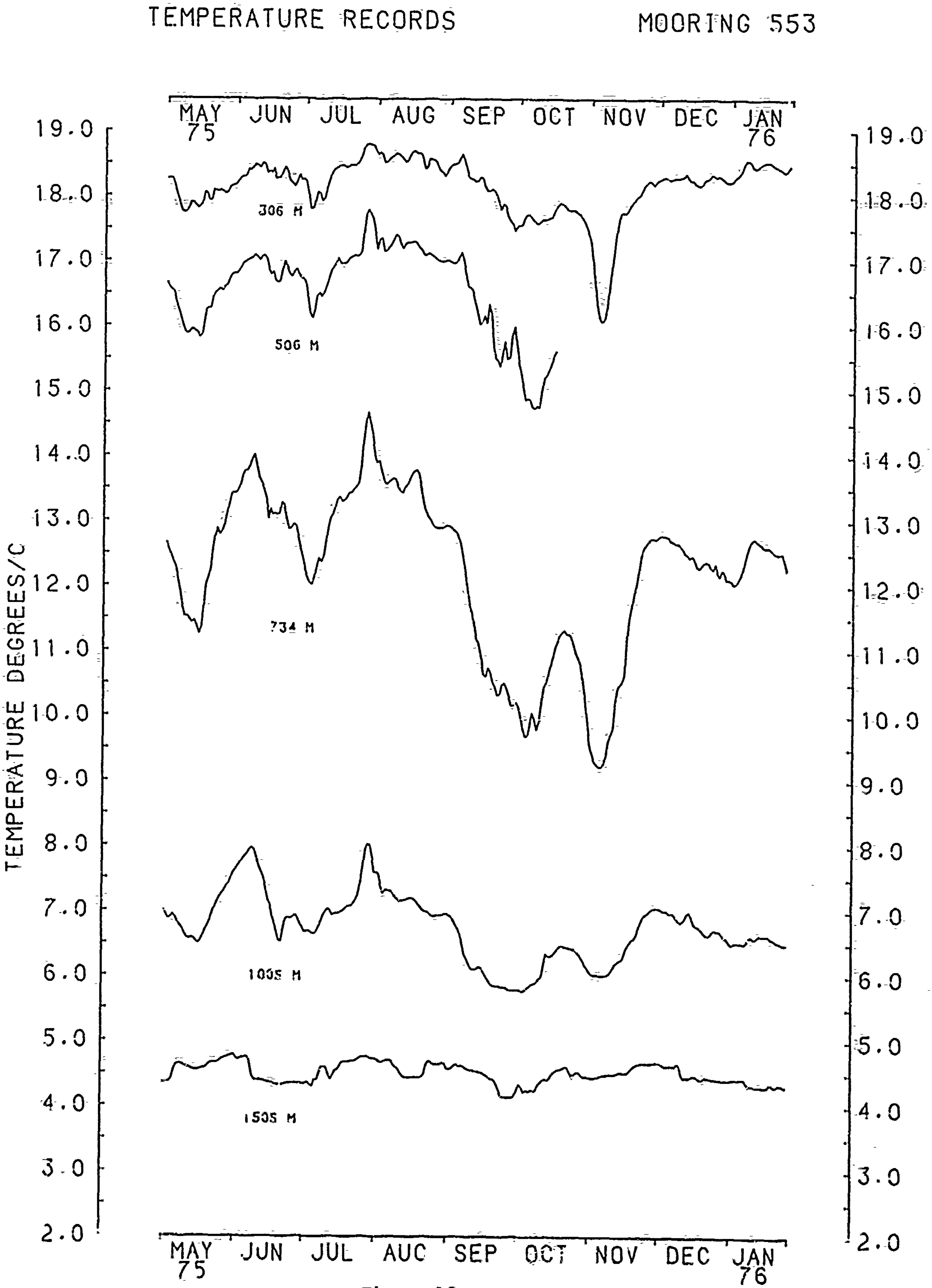

TEMPERATURE RECORDS
MOORING 553
MAY 75
JUN
JUL
AUG
SEP
OCT
NOV
DEC
JAN 76
TEMPERATURE DEGREES/C
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
306 M
506 M
734 M
1005 M
1505 M

Figure 16

CURRENT VECTOR FOR MOORING 570

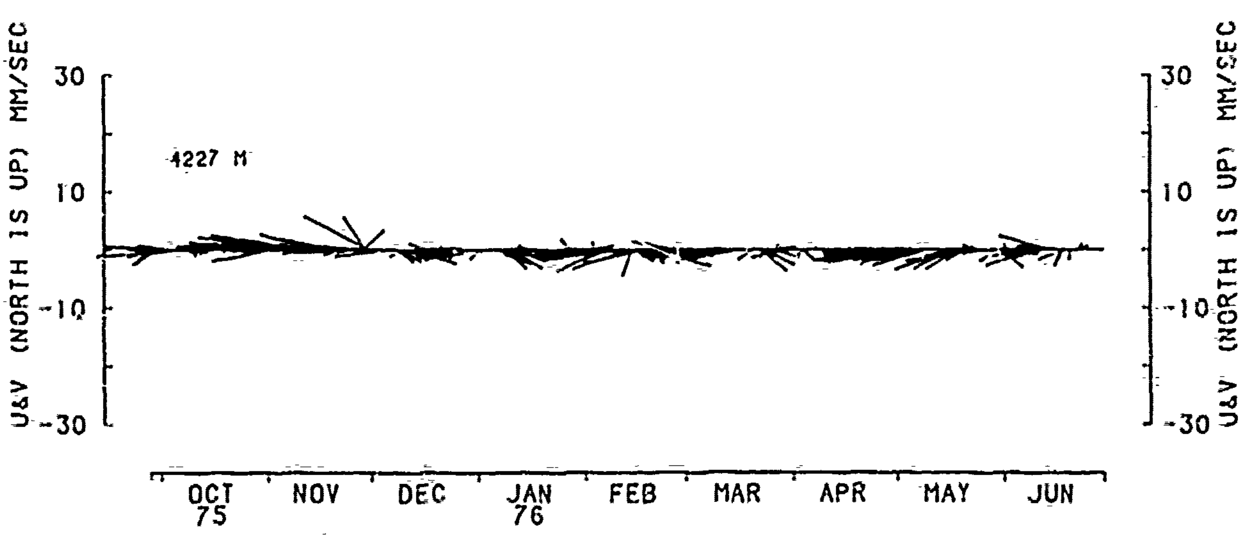


Figure 7

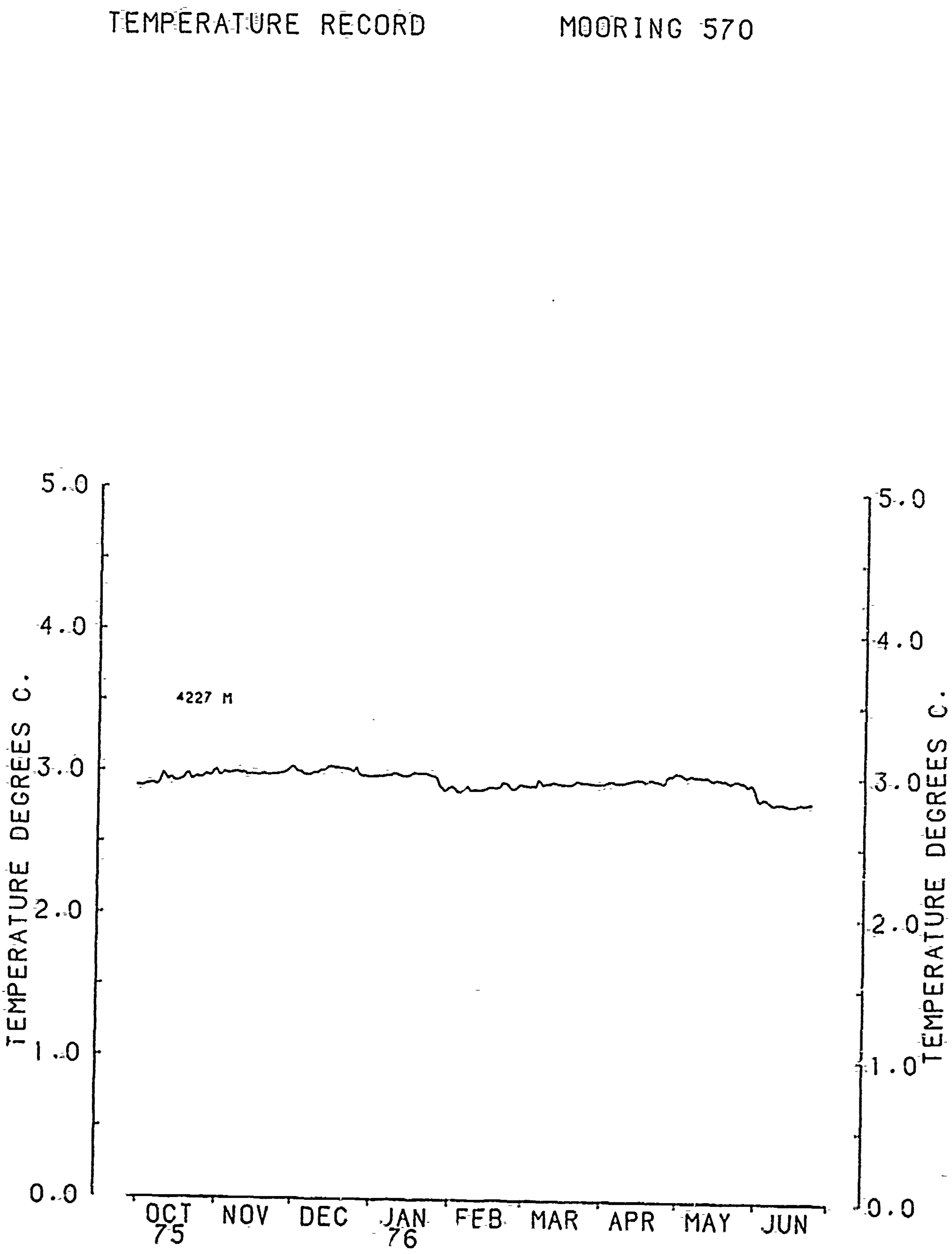

TEMPERATURE RECORD
MOORING 570
4227 M
TEMPERATURE DEGREES C.
0.0
1.0
2.0
3.0
4.0
5.0
OCT
75
NOV
DEC
JAN
76
FEB
MAR
APR
MAY
JUN

Figure 10

CURRENT VECTORS FOR MOORING 633

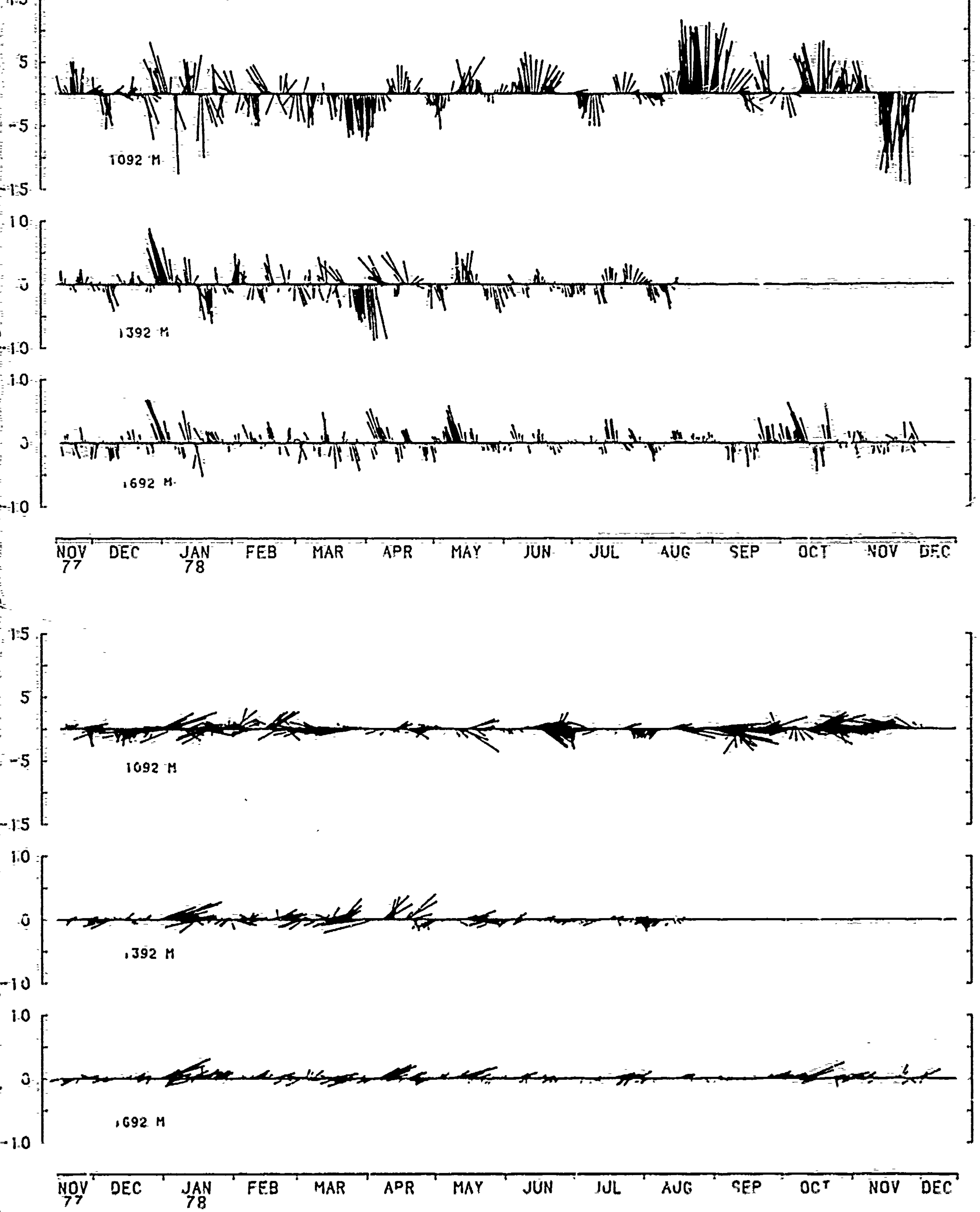


Figure 19

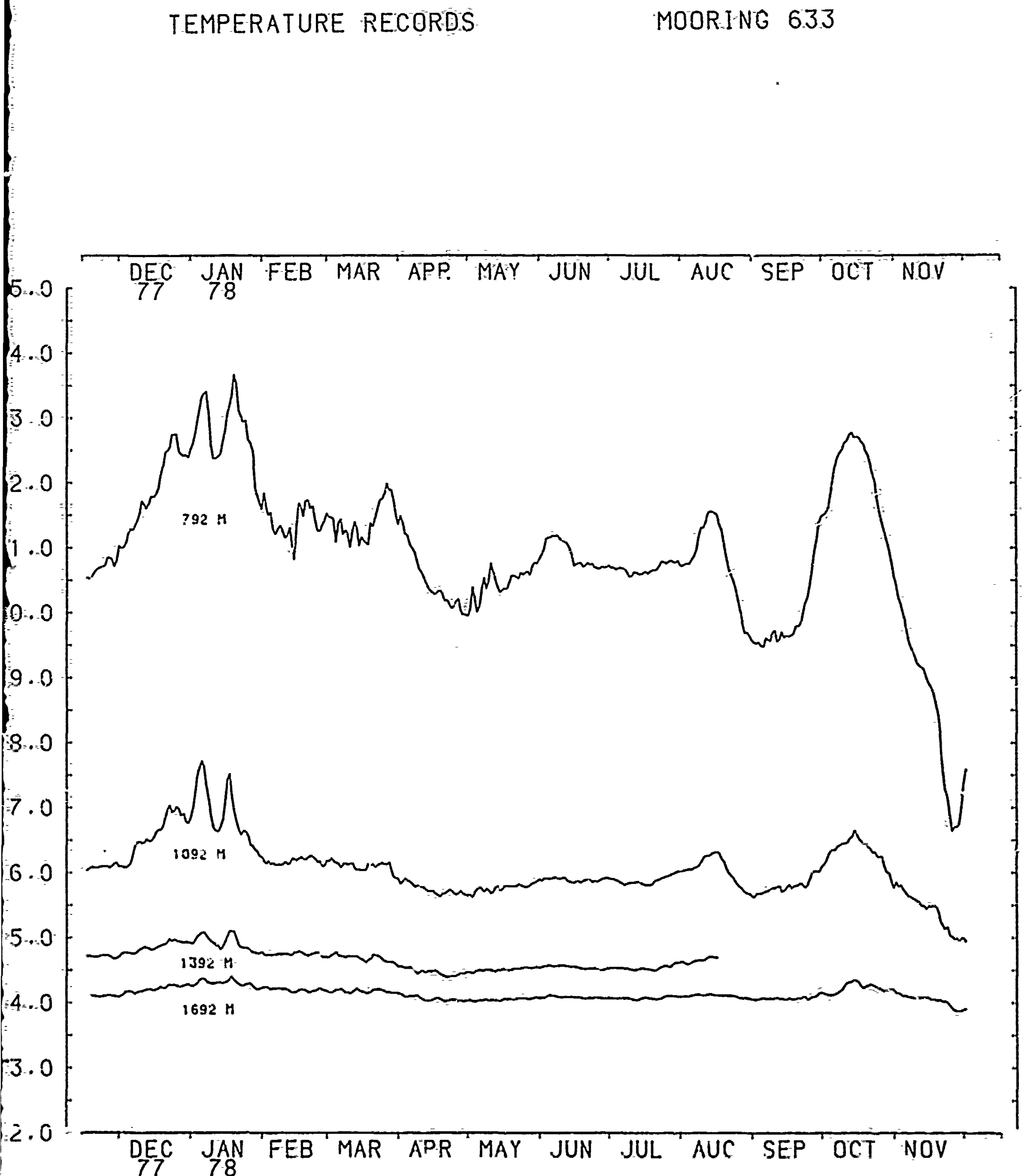
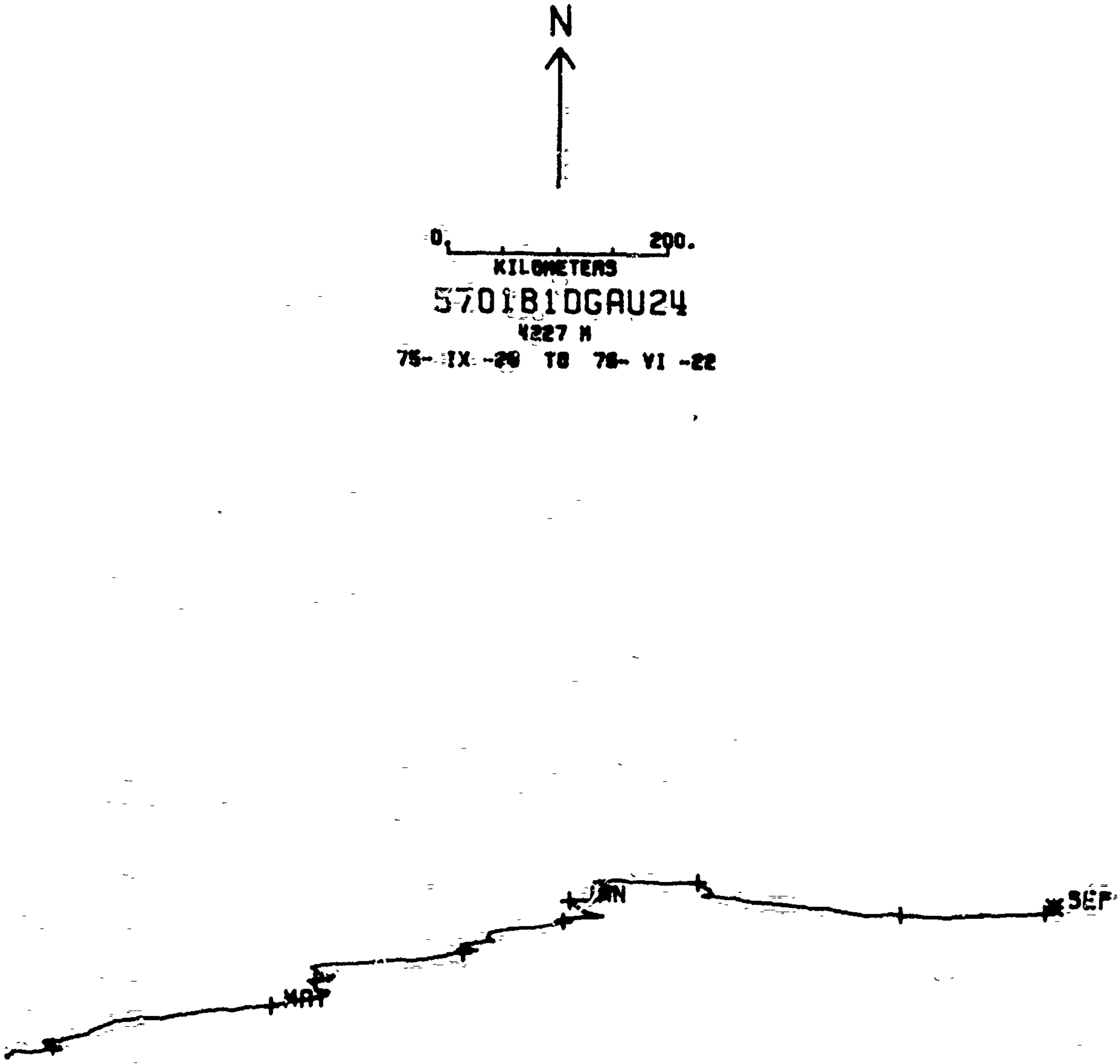
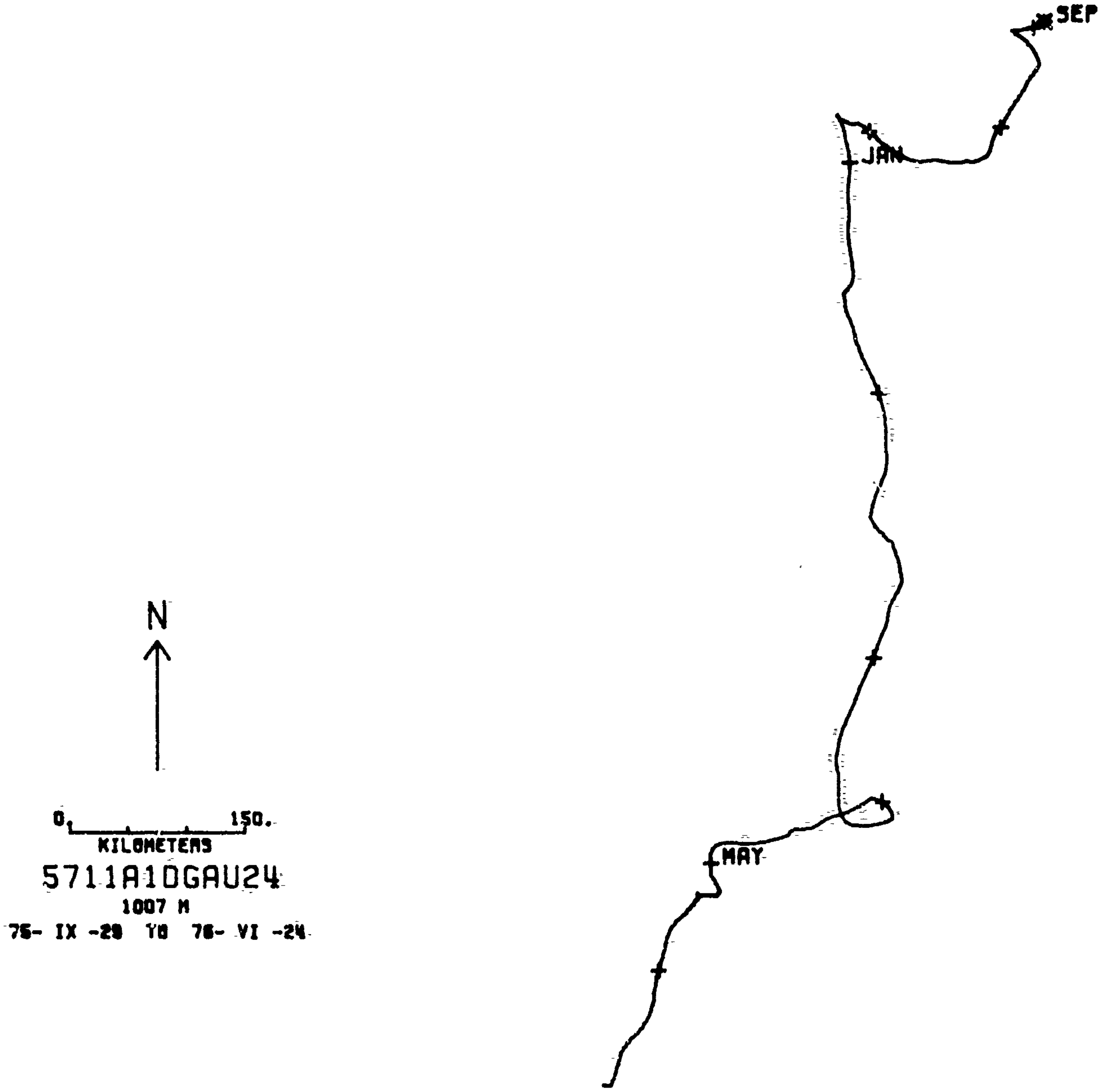
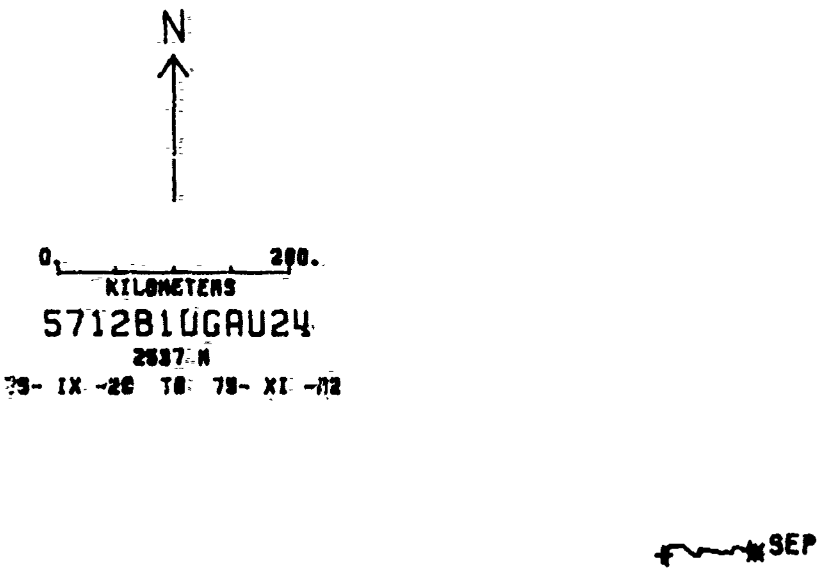
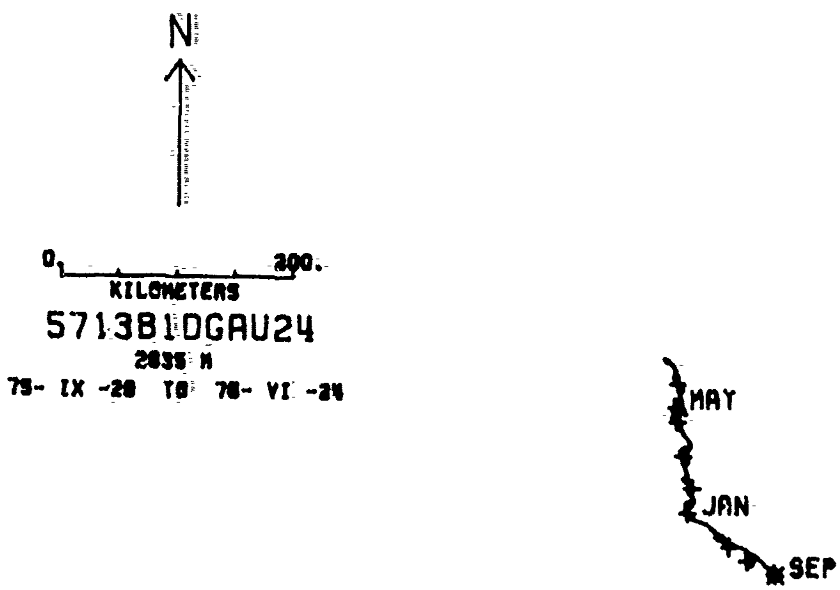

TEMPERATURE RECORDS
MOORING 633
DEC 77
JAN 78
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
5.0
4.0
3.0
2.0
1.0
0.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
792 M
1092 M
1392 M
1692 M

Figure 22

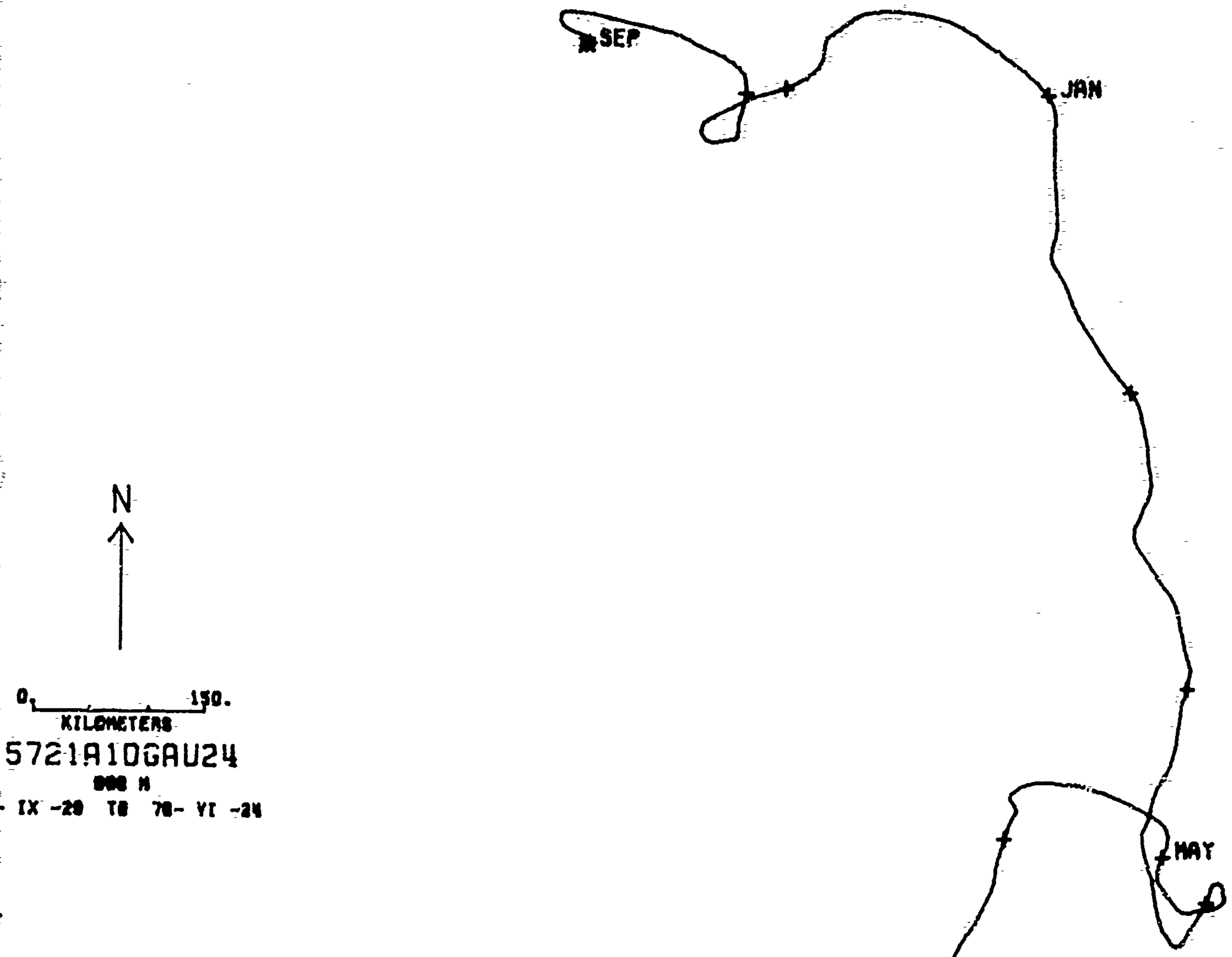

N
0.
200.
KILOMETERS
5701B1DGAU24
4227 M
75- IX -20 TO 76- VI -22
JAN
SEP

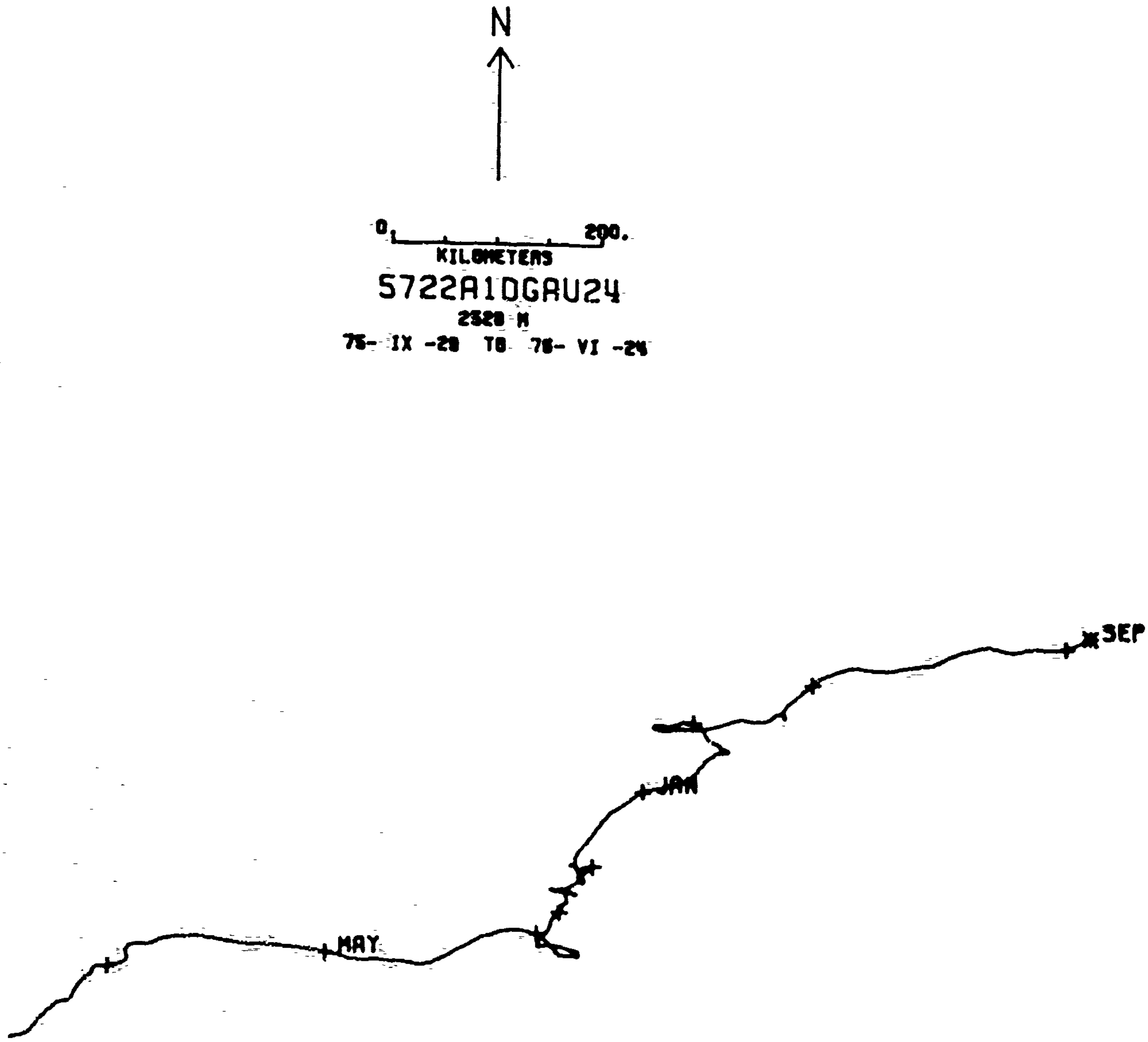

SEP
JAN
MAY
N
0
150.
KILOMETERS
5711A10GAU24
1007 M

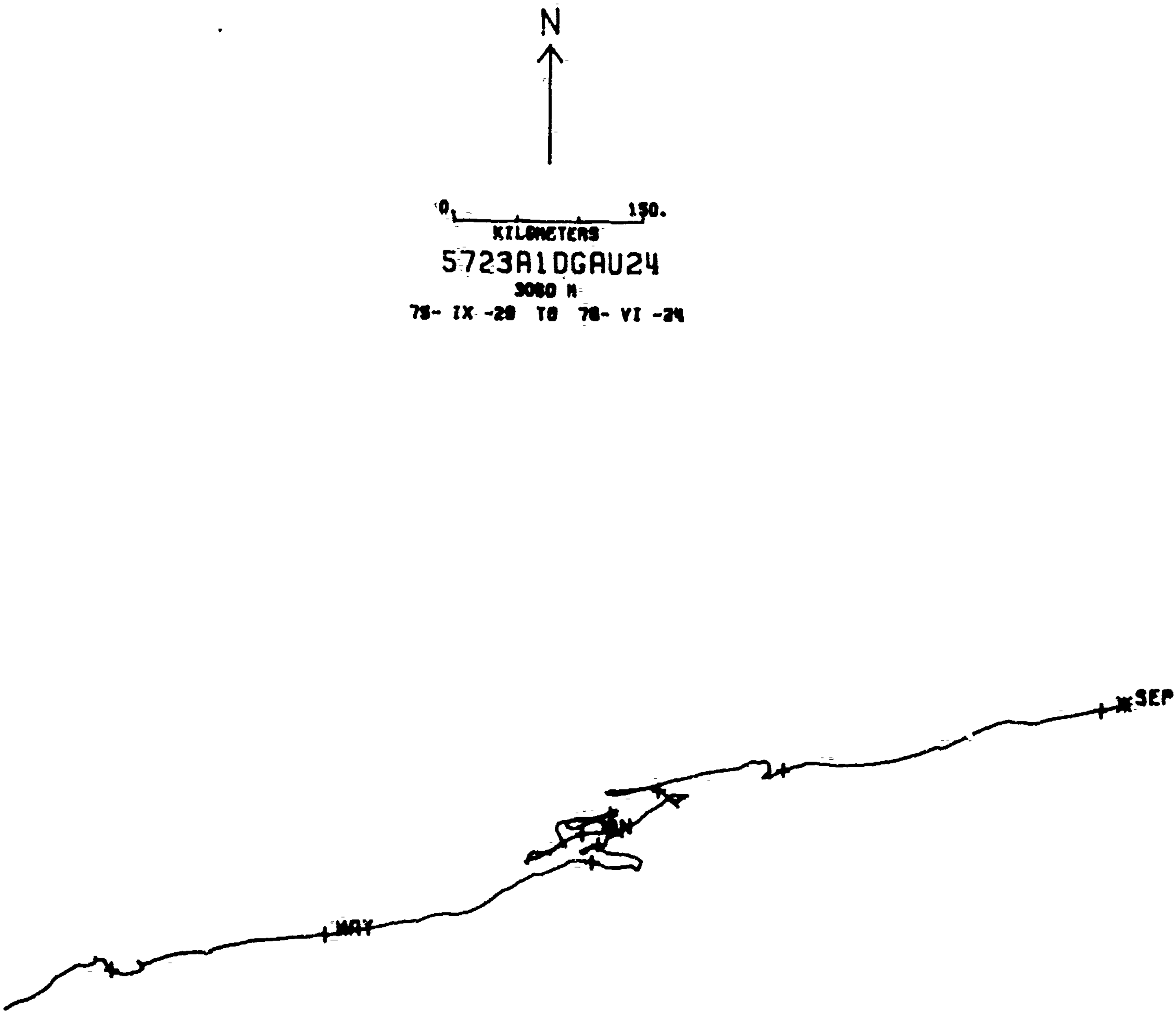

N
0.
200.
KILOMETERS
5712B1UGAU24
79- IX -20 TO 79- XI -02
SEP

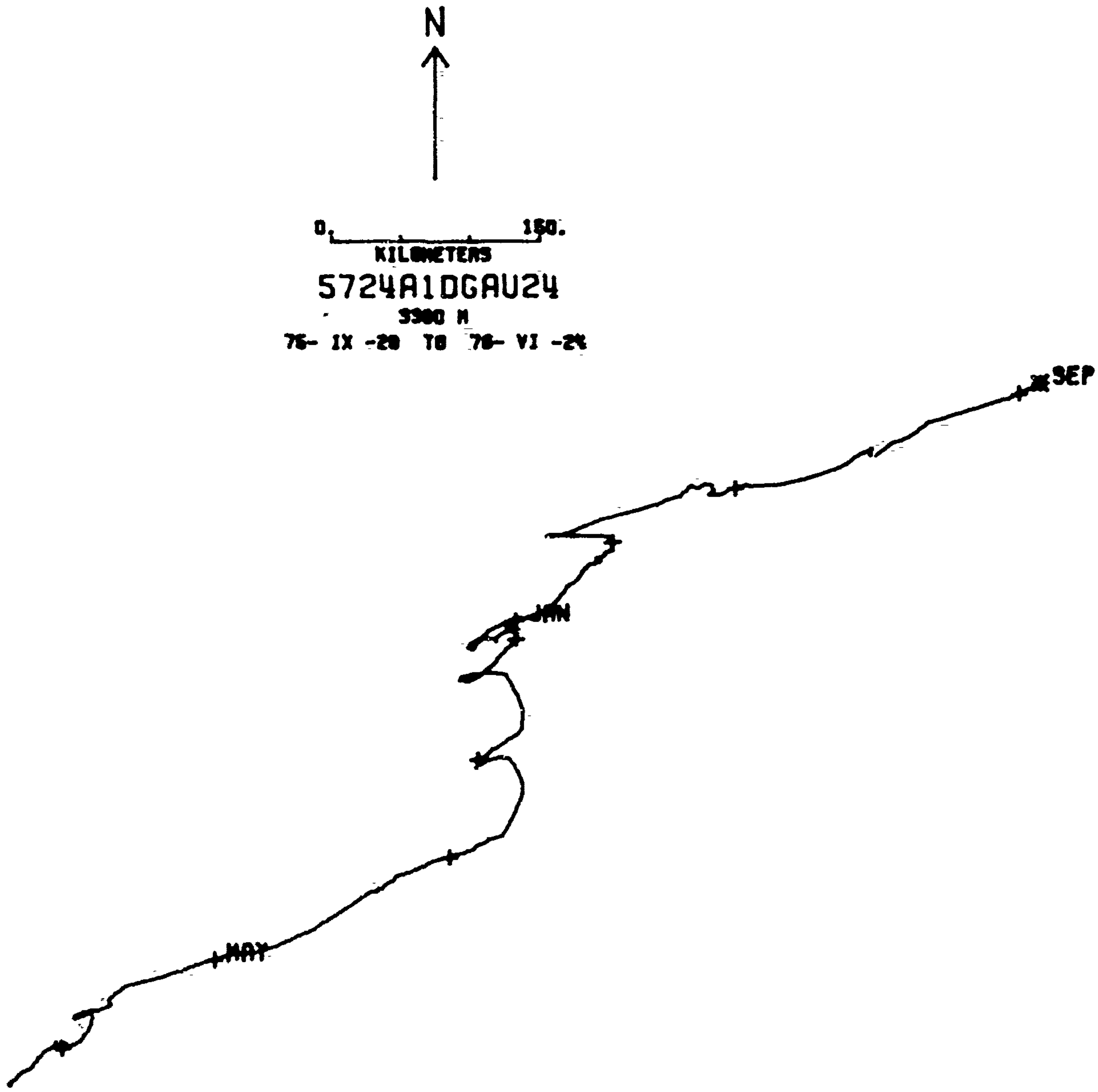


N
0
200.
KILOMETERS
5713B1DGAU24
2035 M
75- IX -20 TO 76- VI -24
MAY
JAN
SEP


SEP
JAN
MAY
N
0
150.
KILOMETERS
5721A10GAU24


N
0.
200.
KILOMETERS
5722A1DGAU24
2320 M
75- IX -20 TO 76- VI -24
SEP
JAN
MAY


N
0.
150.
KILOMETERS
5723A1DGAU24
3080 M
75- IX -28 TO 76- VI -24
SEP
MAY


N
0.
150.
KILOMETERS
5724A1DGAU24
3300 M
76- IX -20 TO 78- VI -24
SEP
JAN
MAY

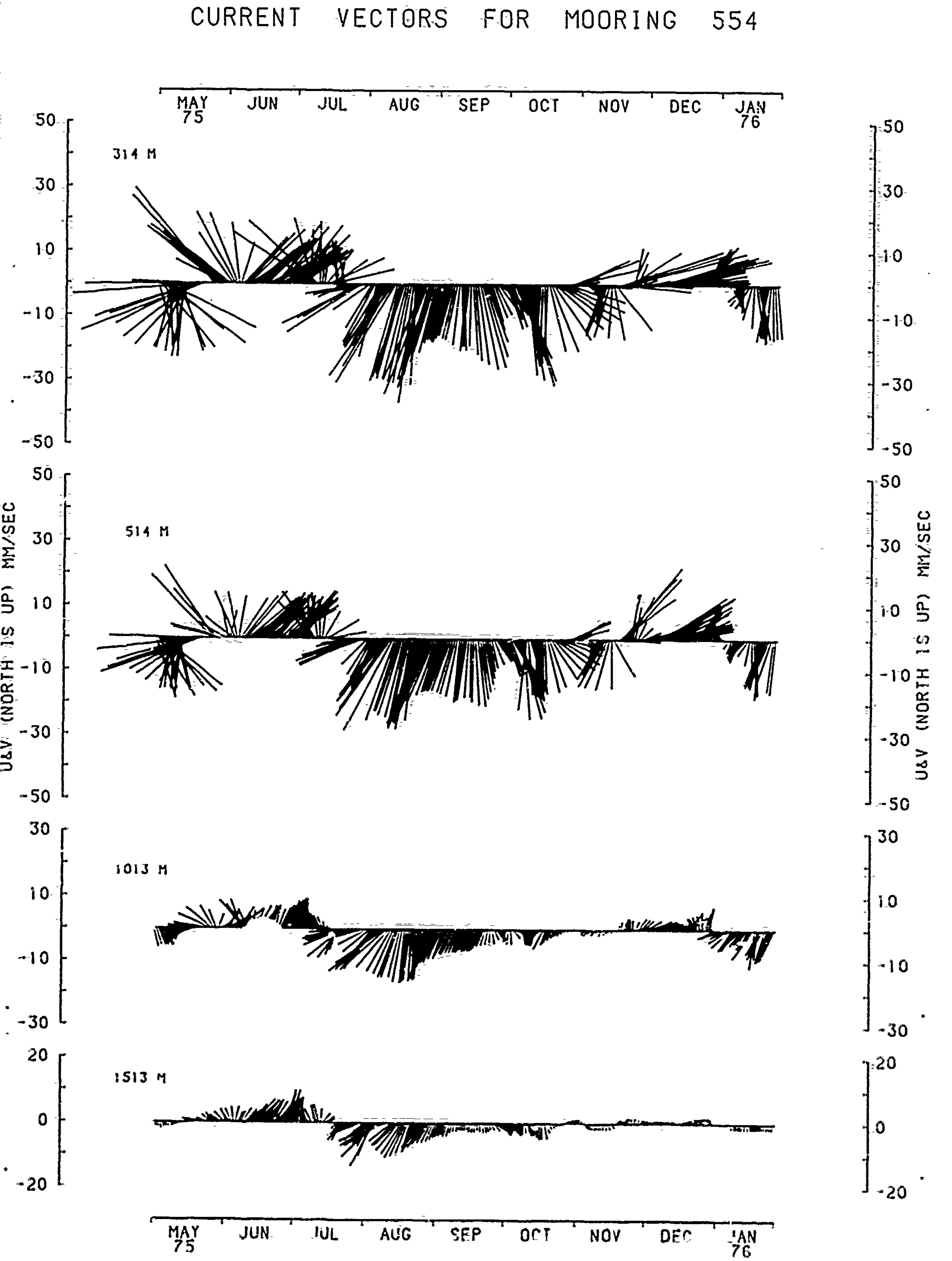

CURRENT VECTORS FOR MOORING 554
MAY 75
JUN
JUL
AUG
SEP
OCT
NOV
DEC
JAN 76
314 M
514 M
1013 M
1513 M
U&V (NORTH IS UP) MM/SEC
50
30
10
-10
-30
-50
20
0
-20

Figure 14

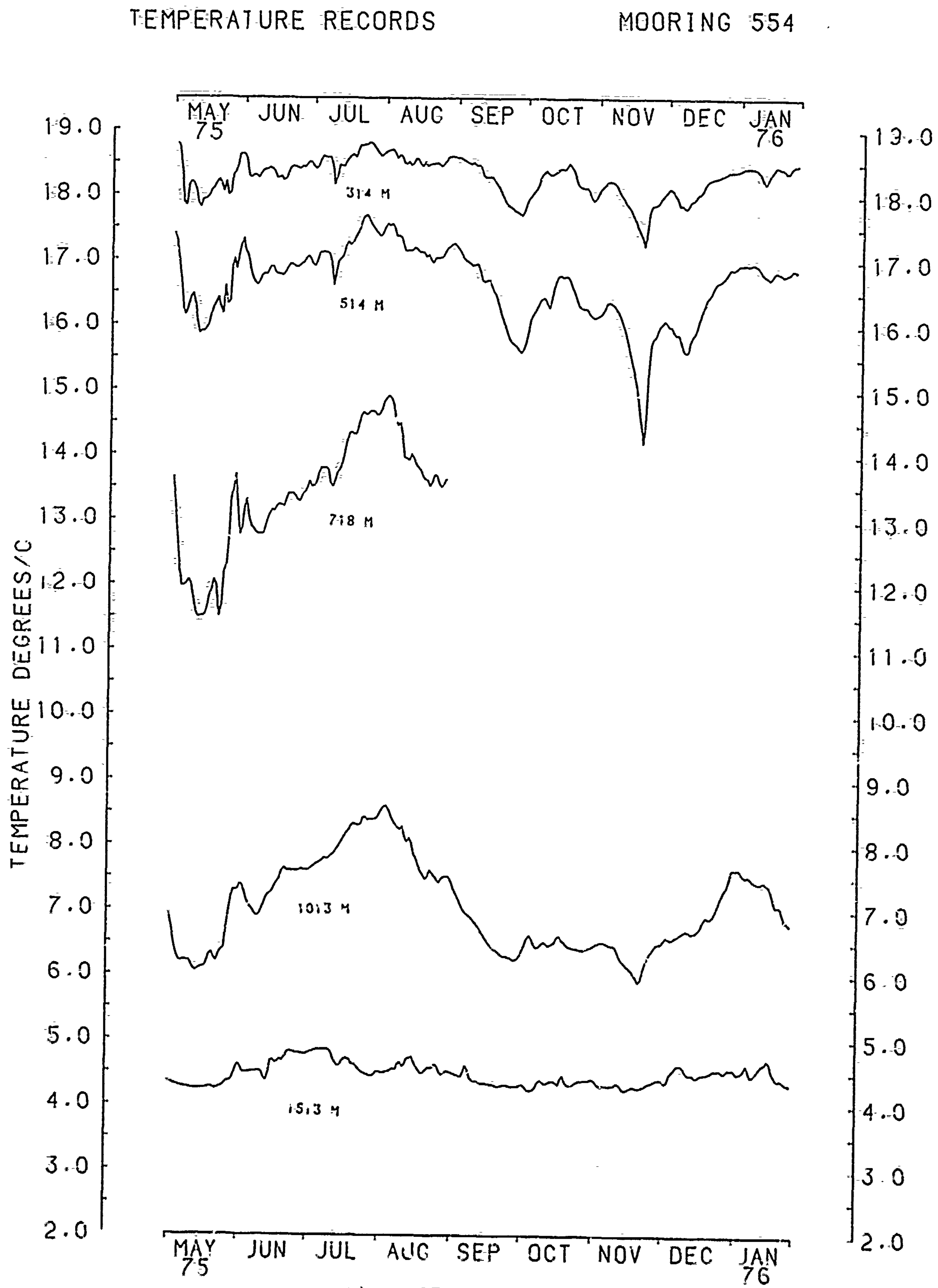

TEMPERATURE RECORDS
MOORING 554
MAY 75
JUN
JUL
AUG
SEP
OCT
NOV
DEC
JAN 76
TEMPERATURE DEGREES/C
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
314 M
514 M
718 M
1013 M
1513 M

Figure 17

CURRENT VECTORS FOR MOORING 571

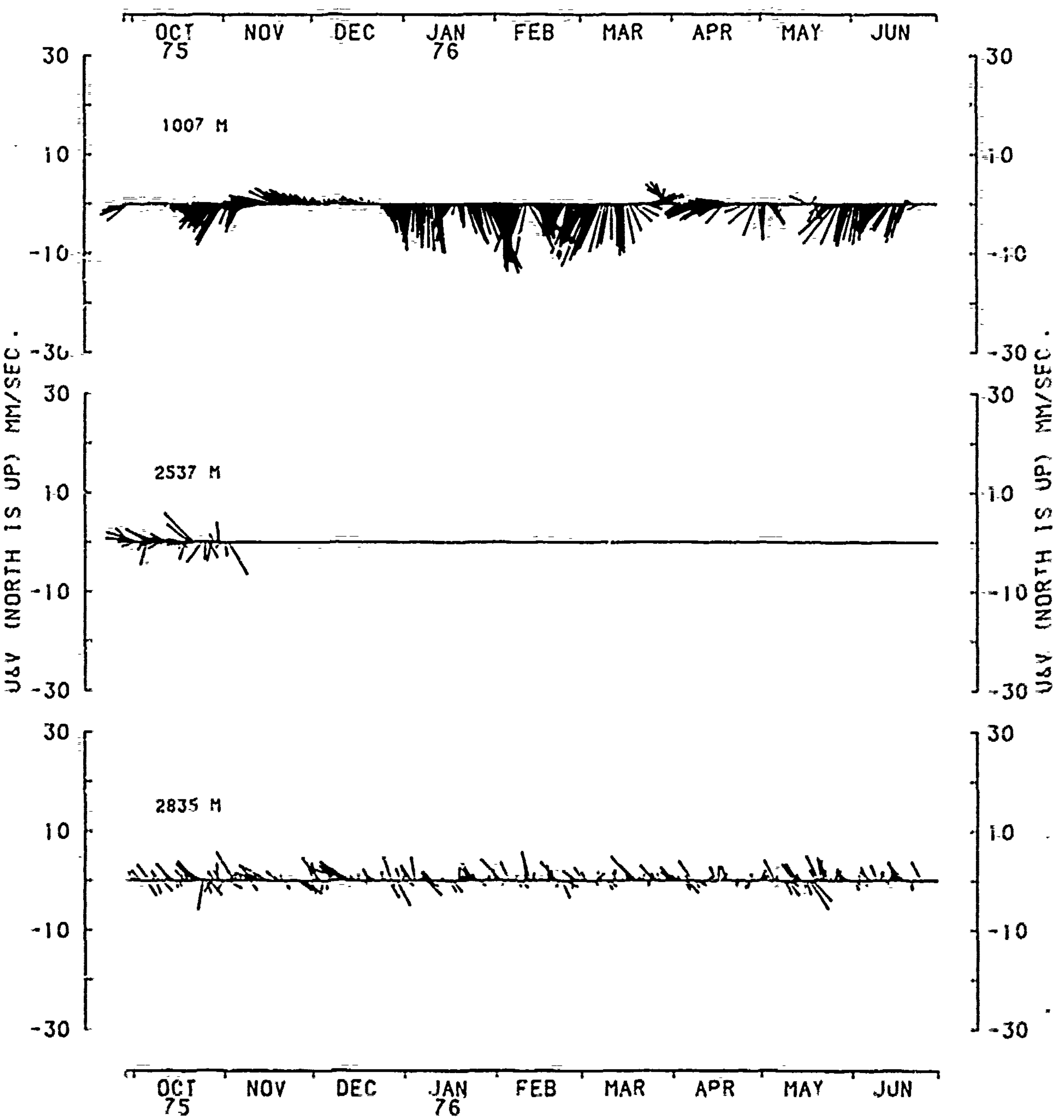


Figure 8

TEMPERATURE RECORDS MOORING 571

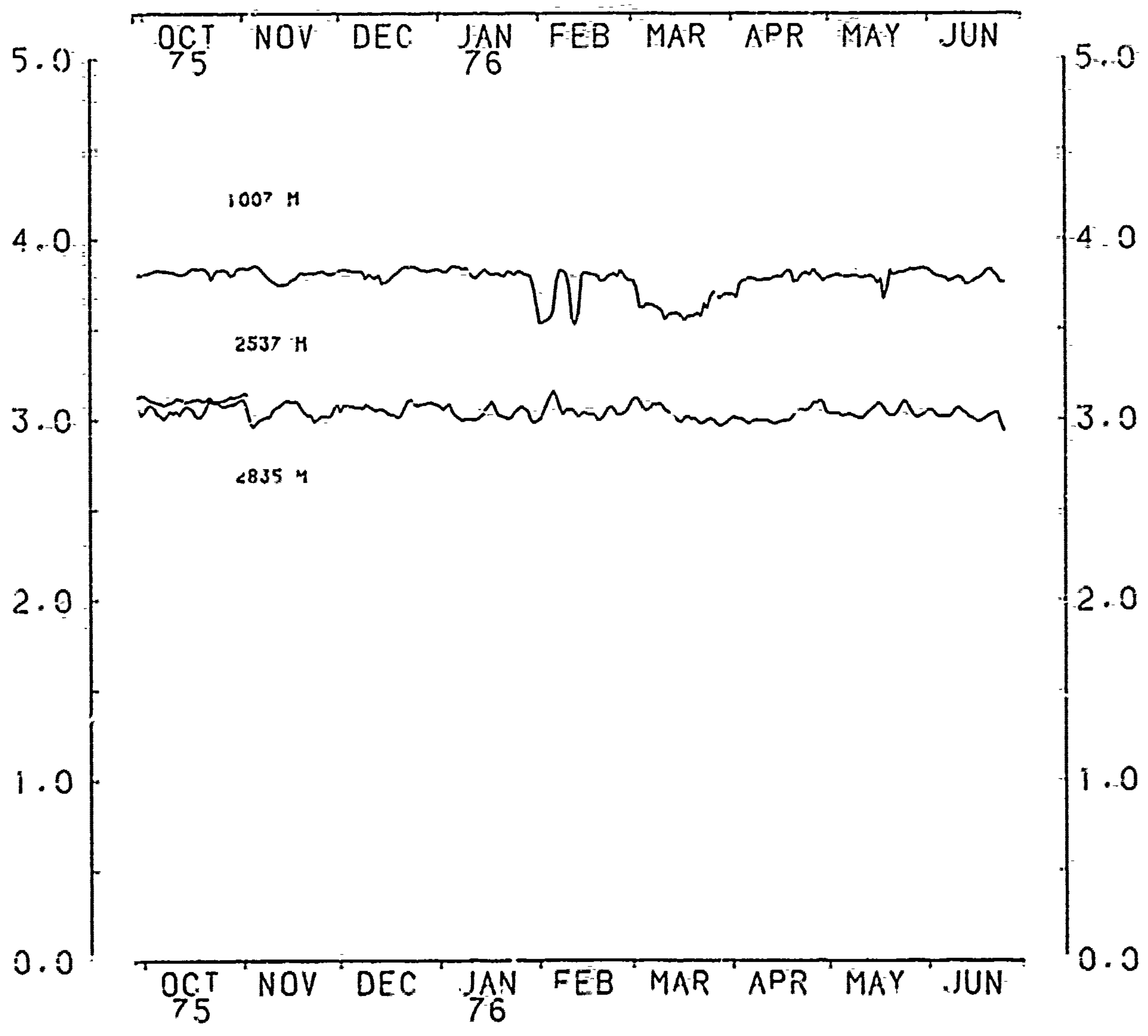


Figure 11

CURRENT VECTORS FOR MOORING 634

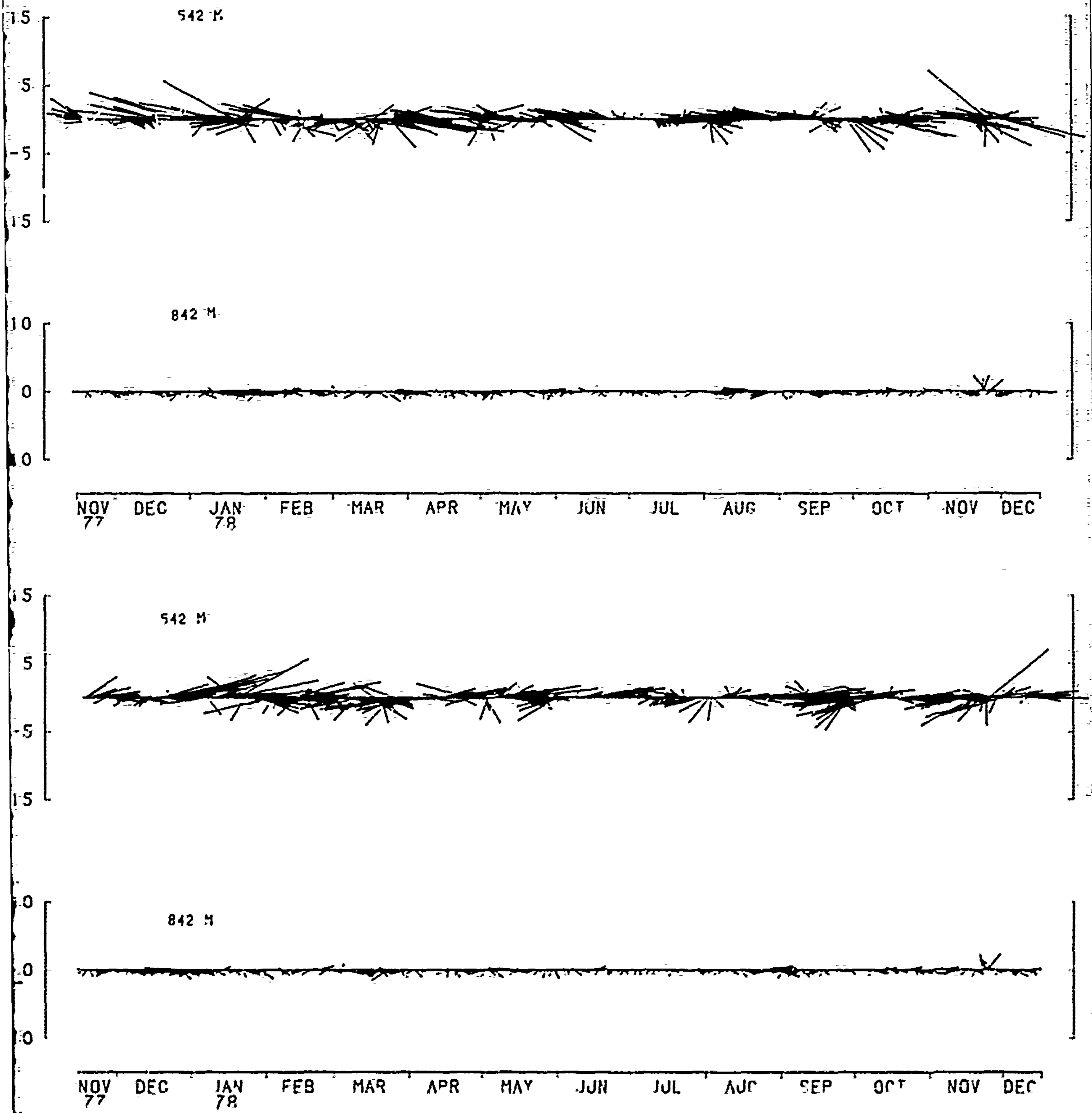


Figure 20

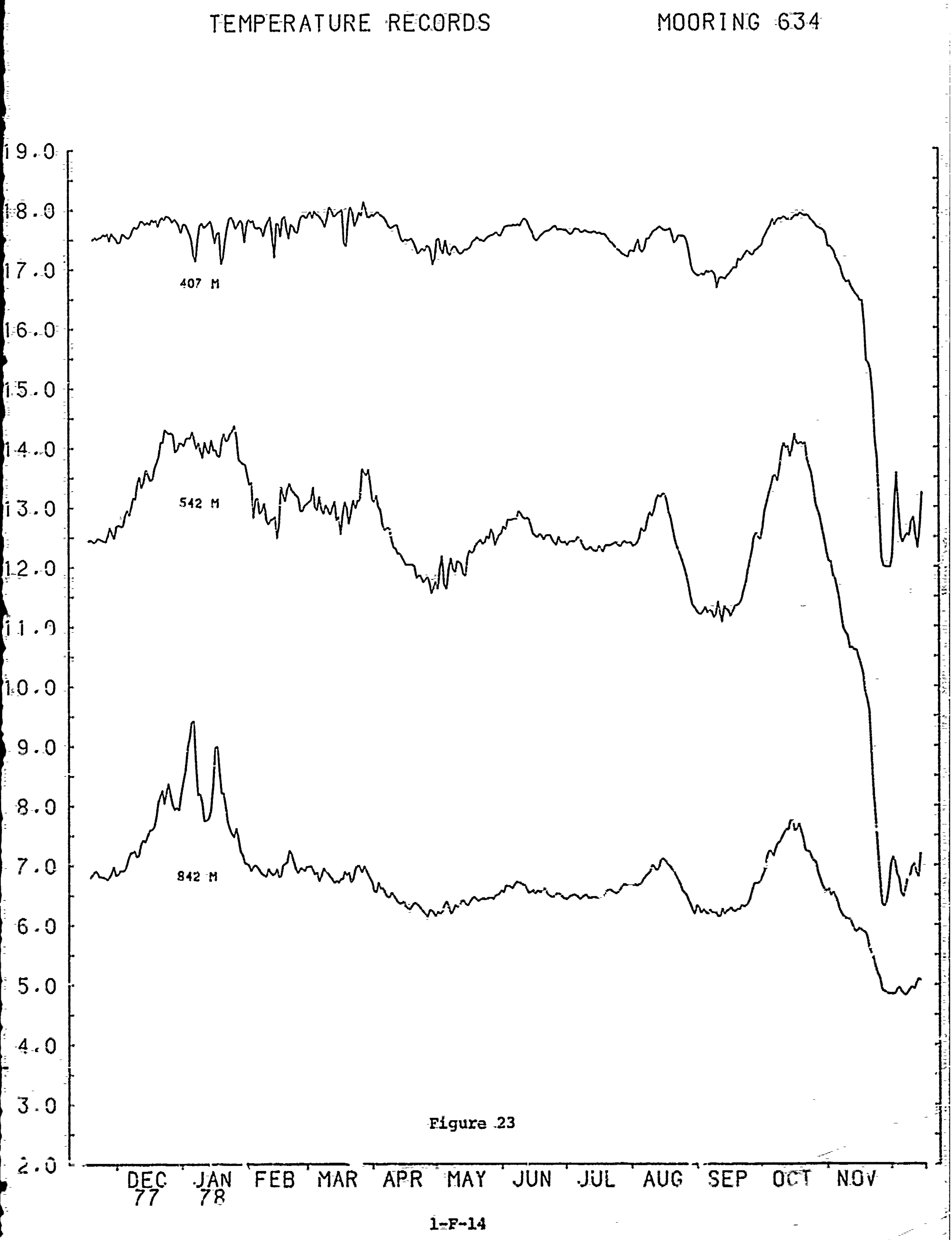
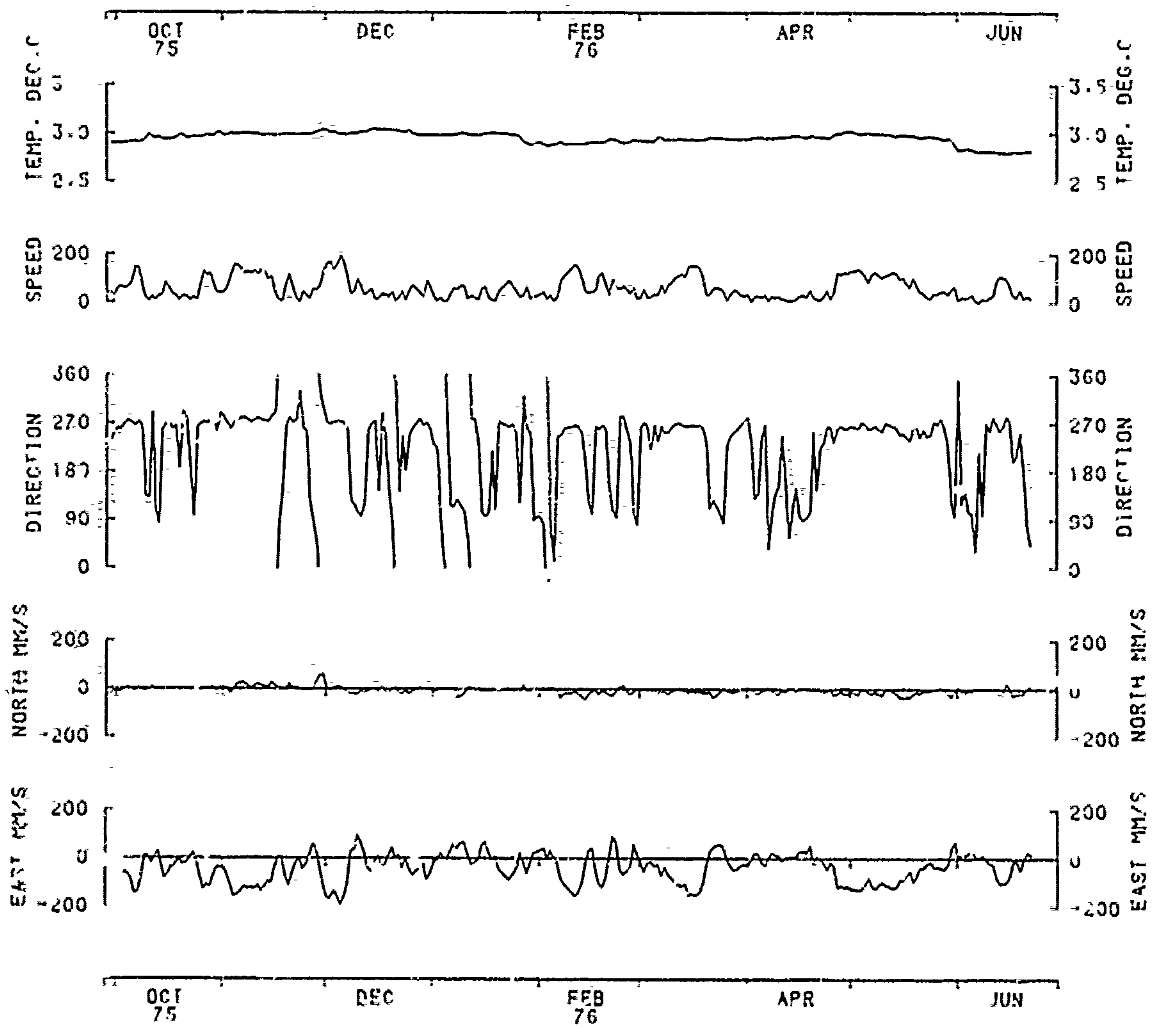
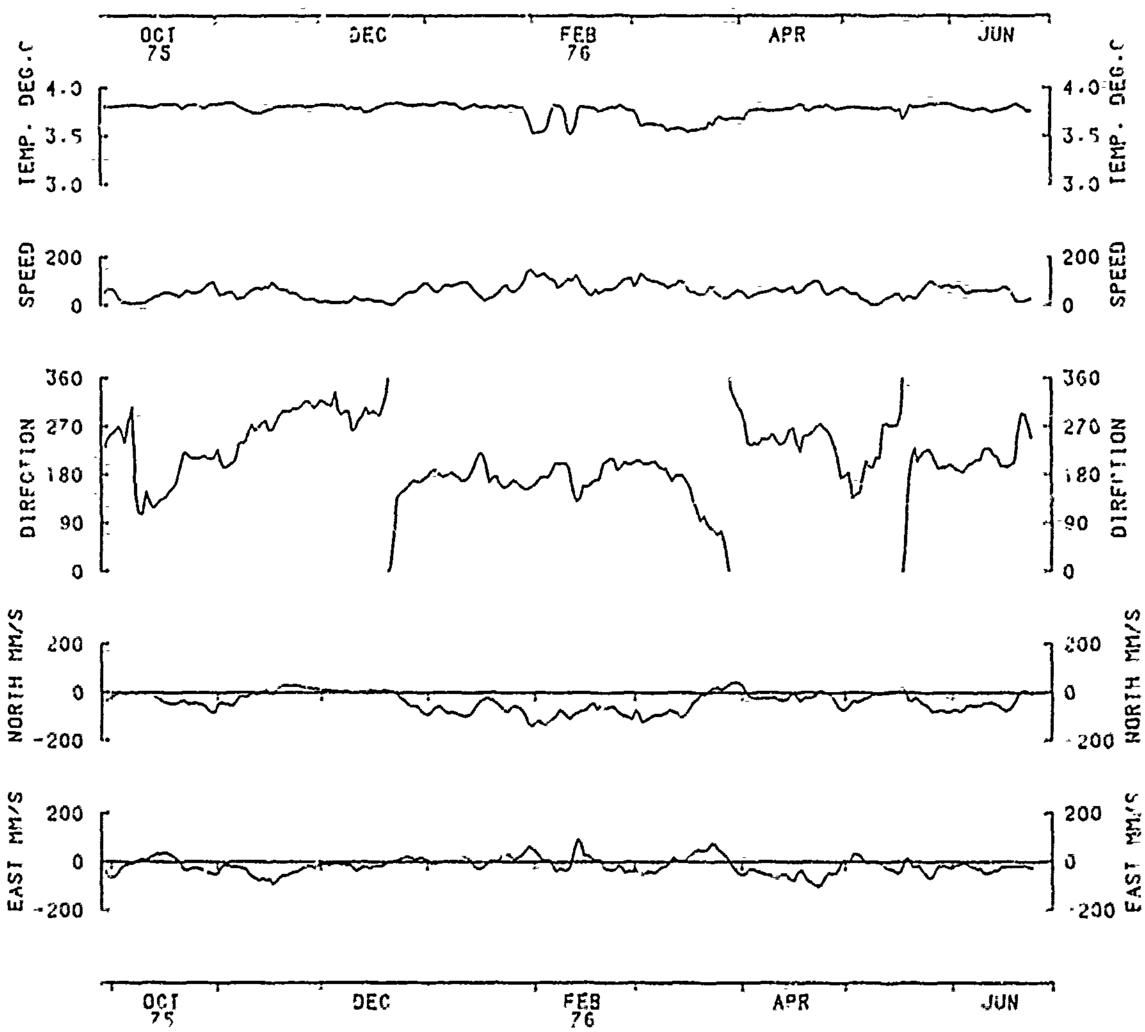

TEMPERATURE RECORDS
MOORING 634
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
407 M
542 M
842 M
DEC 77
JAN 78
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV

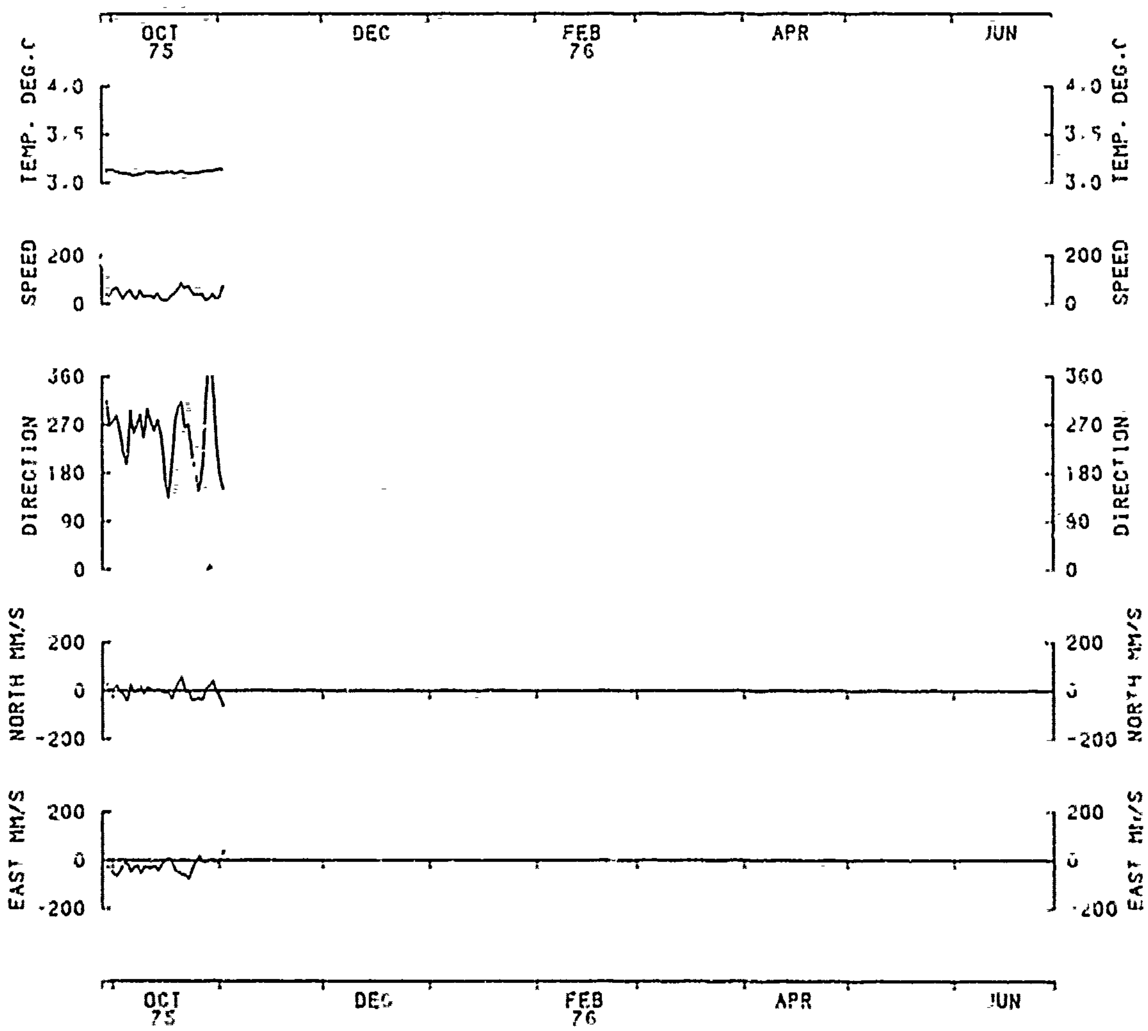
Figure 23



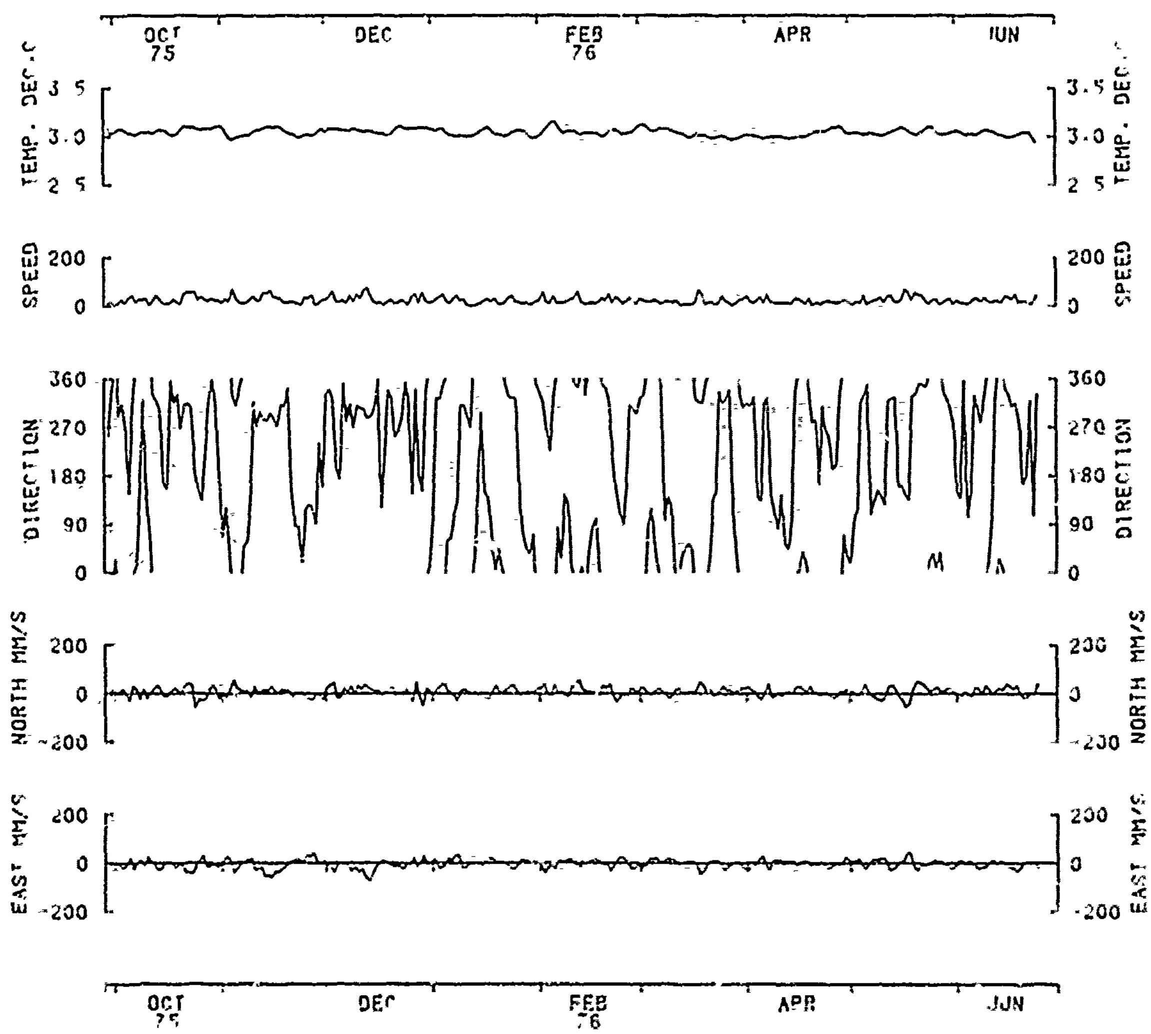
RECORD #5701B1DGAU24 DEPTH=4227 METERS



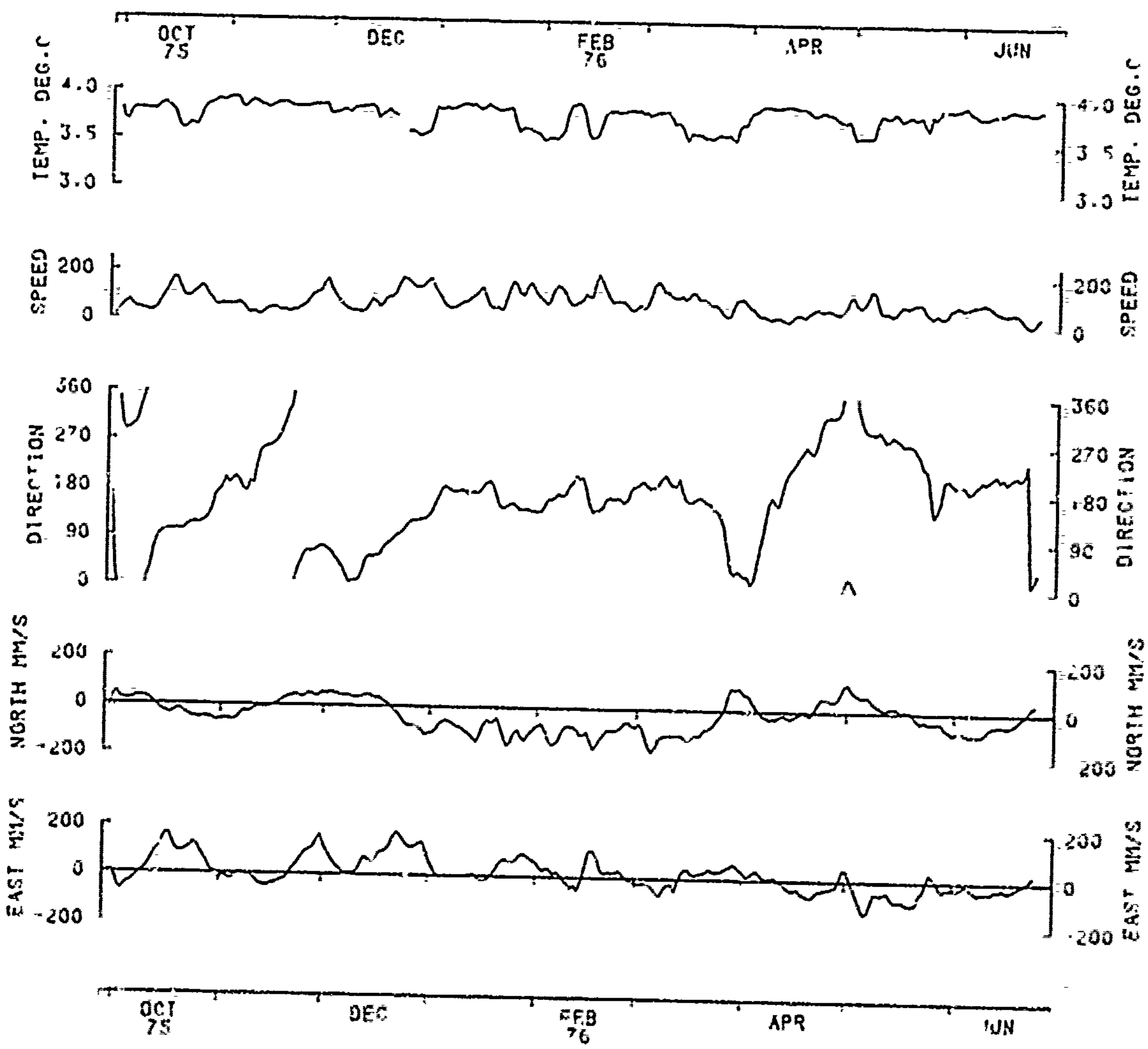
RECORD #5711A1DGAU24 DEPTH=1007 METERS



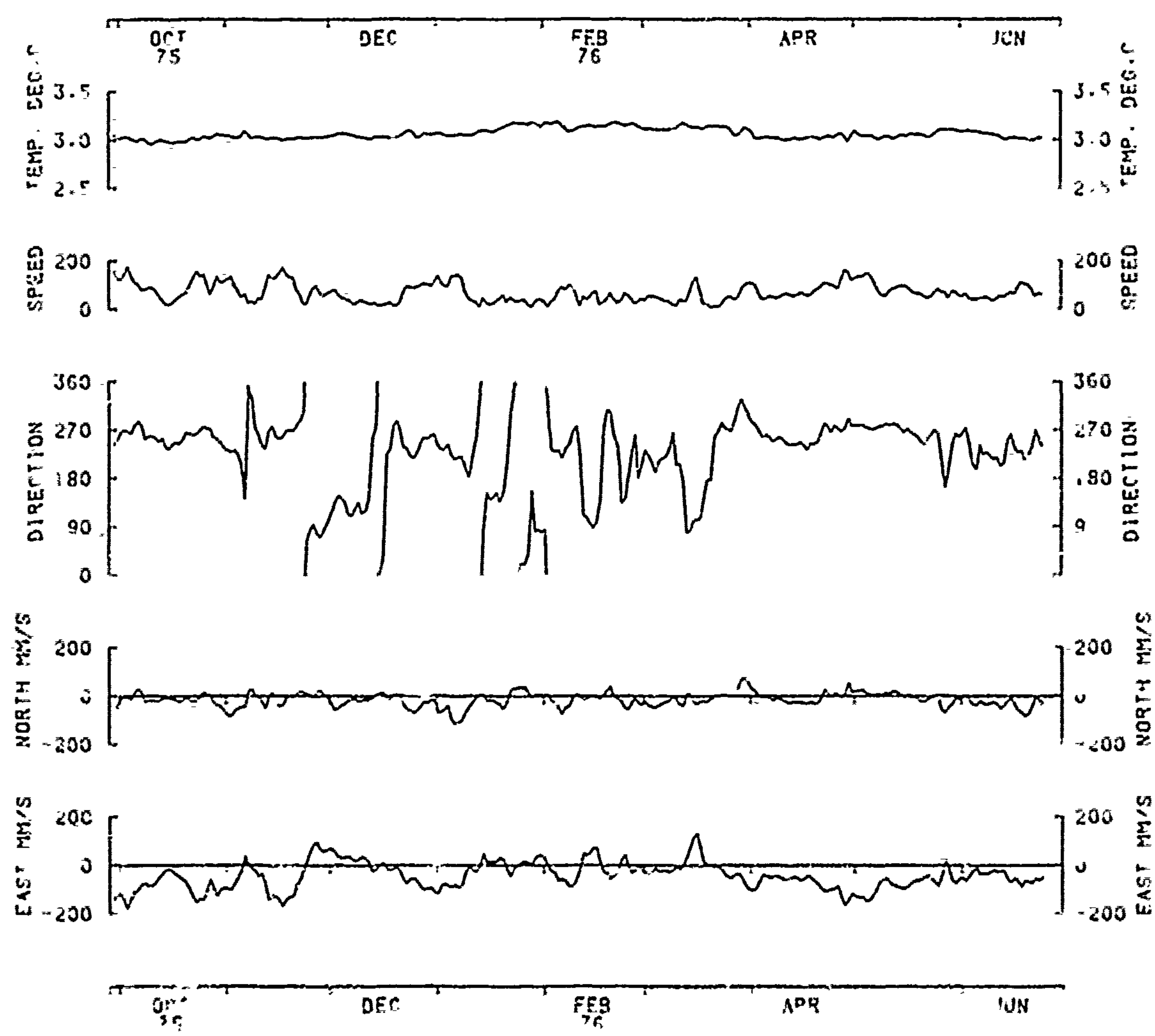
RECORD #5712B1DCAU24 DEPTH=2537 METERS



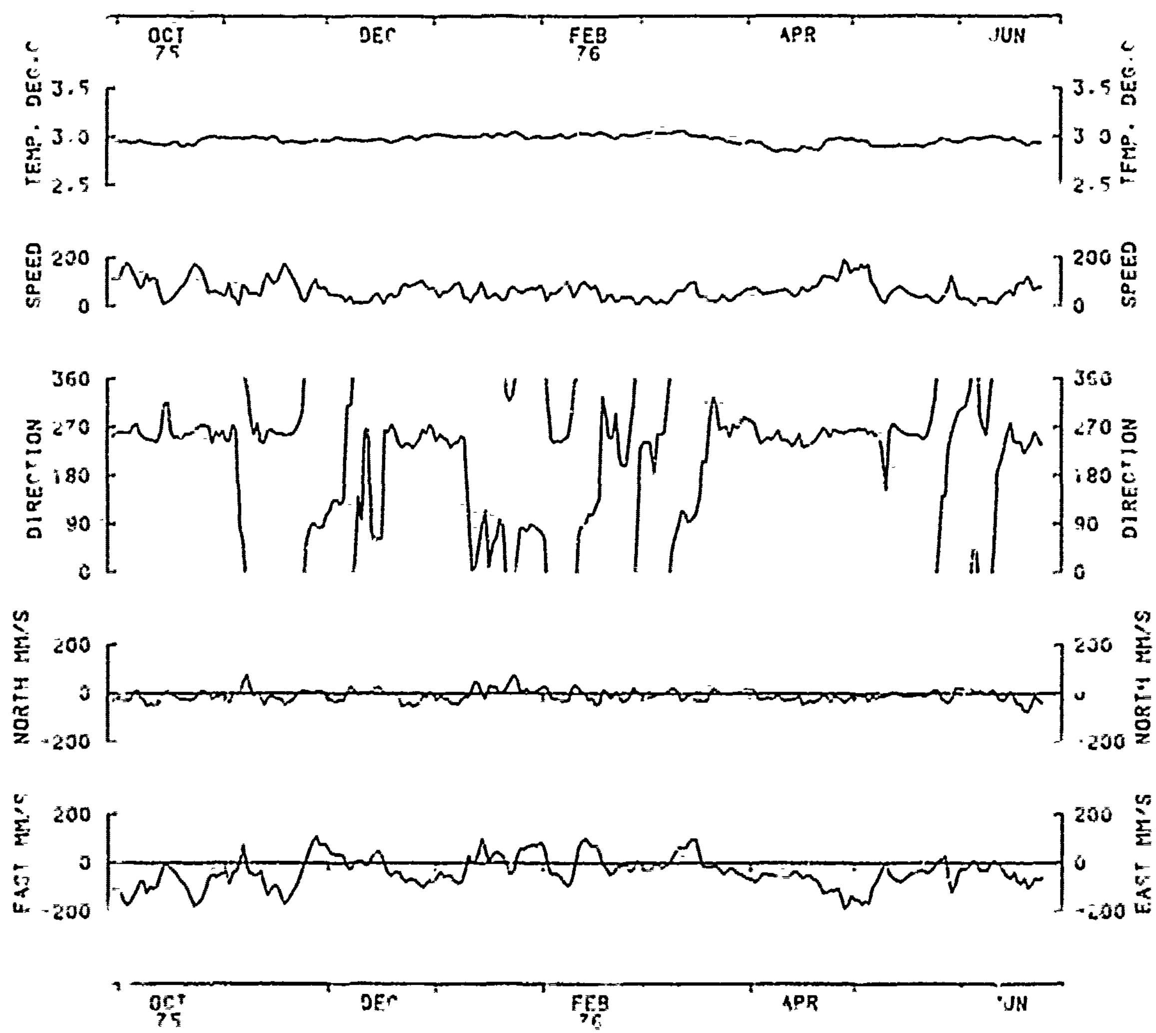
RECORD #5713B1DGAU24 DEPTH=2835 METERS



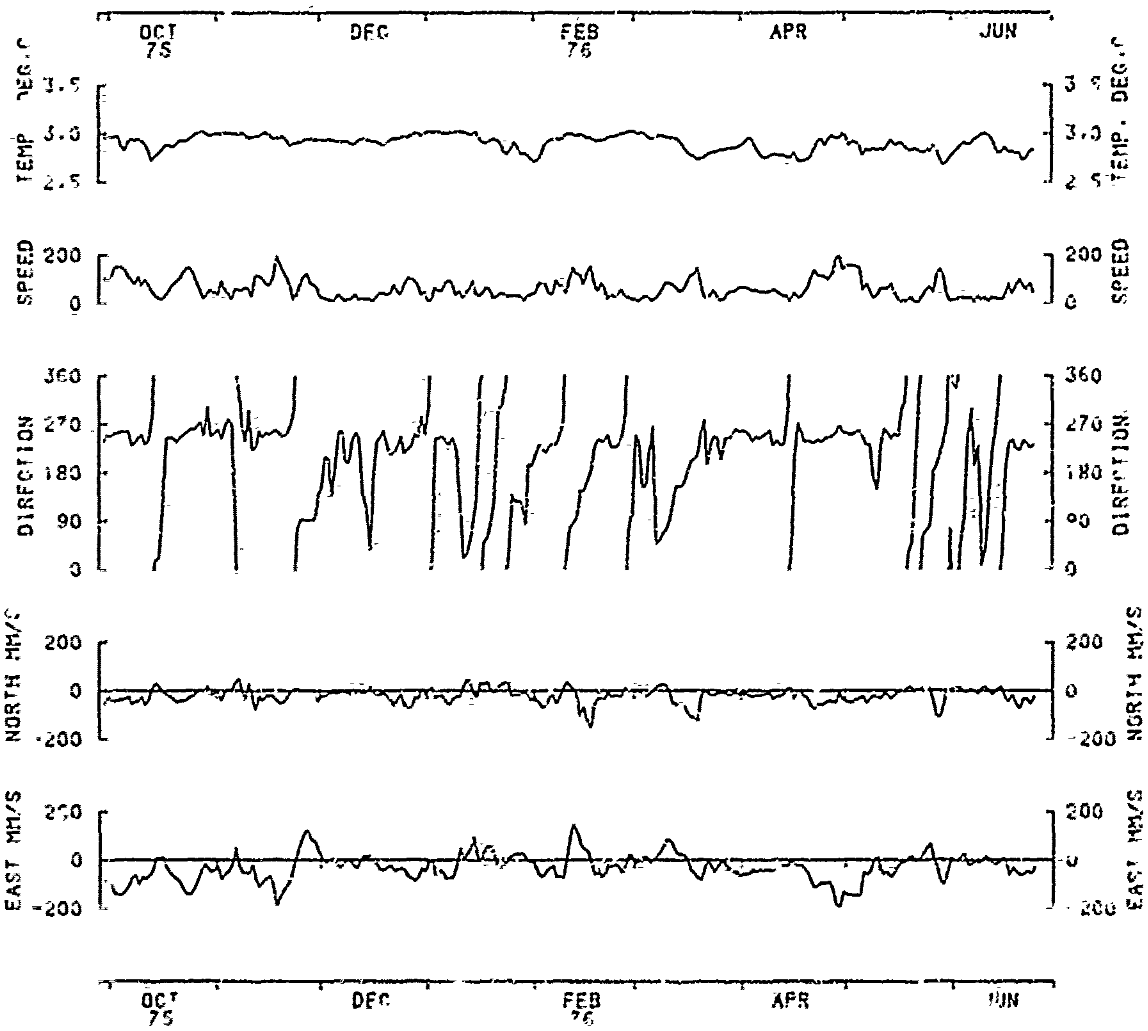
RECORD #5721A1DGAU24 DEPTH=998 METERS



RECORD #5722A1DCAU24 DEPTH=2528 METERS



RECORD #5723A1DCAU24 DEPTH=3060 METERS



RECORD #5724A1DGAU24 DEPTH=3360 METERS

CURRENT VECTORS FOR MOORING 555

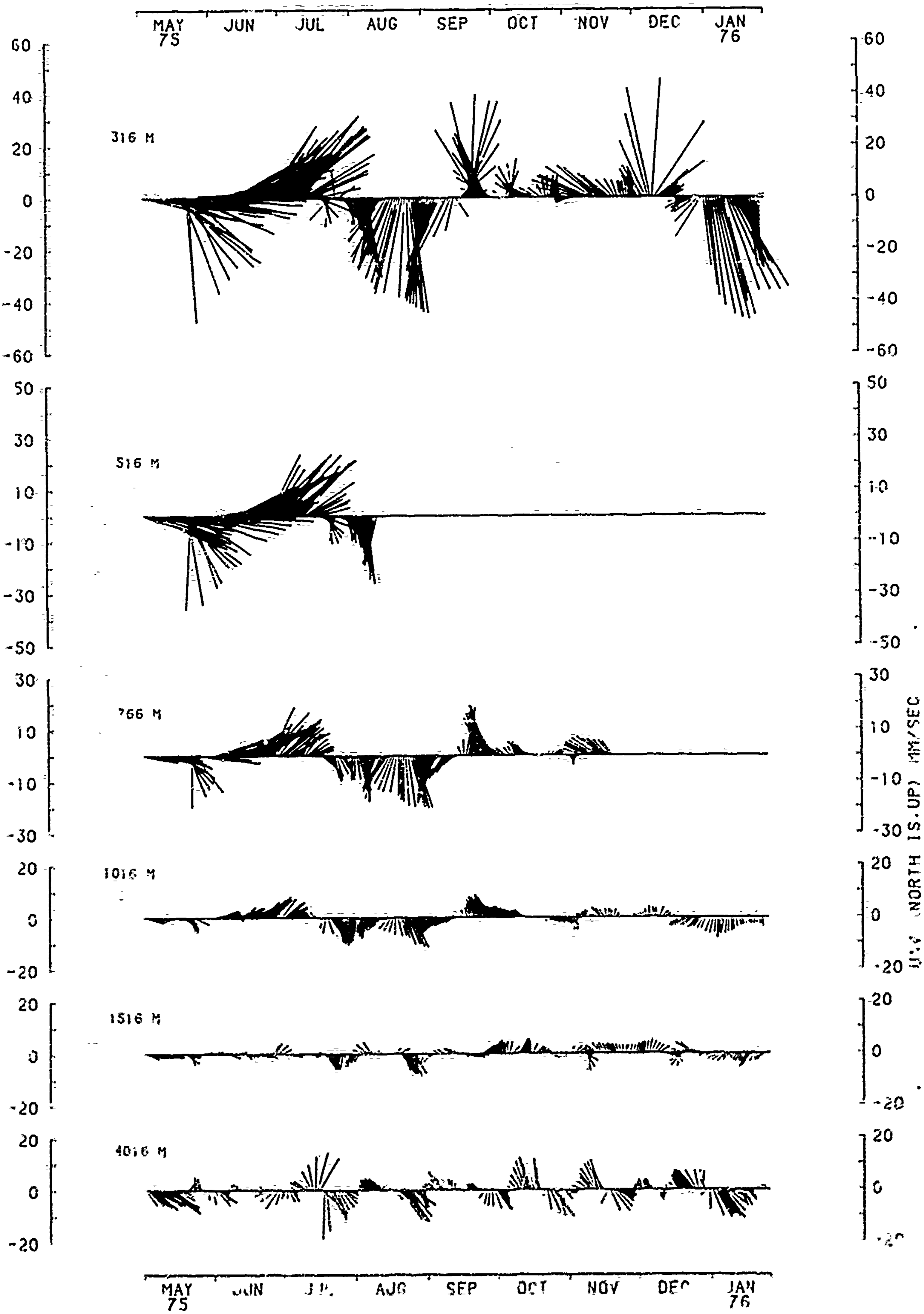


Figure 15

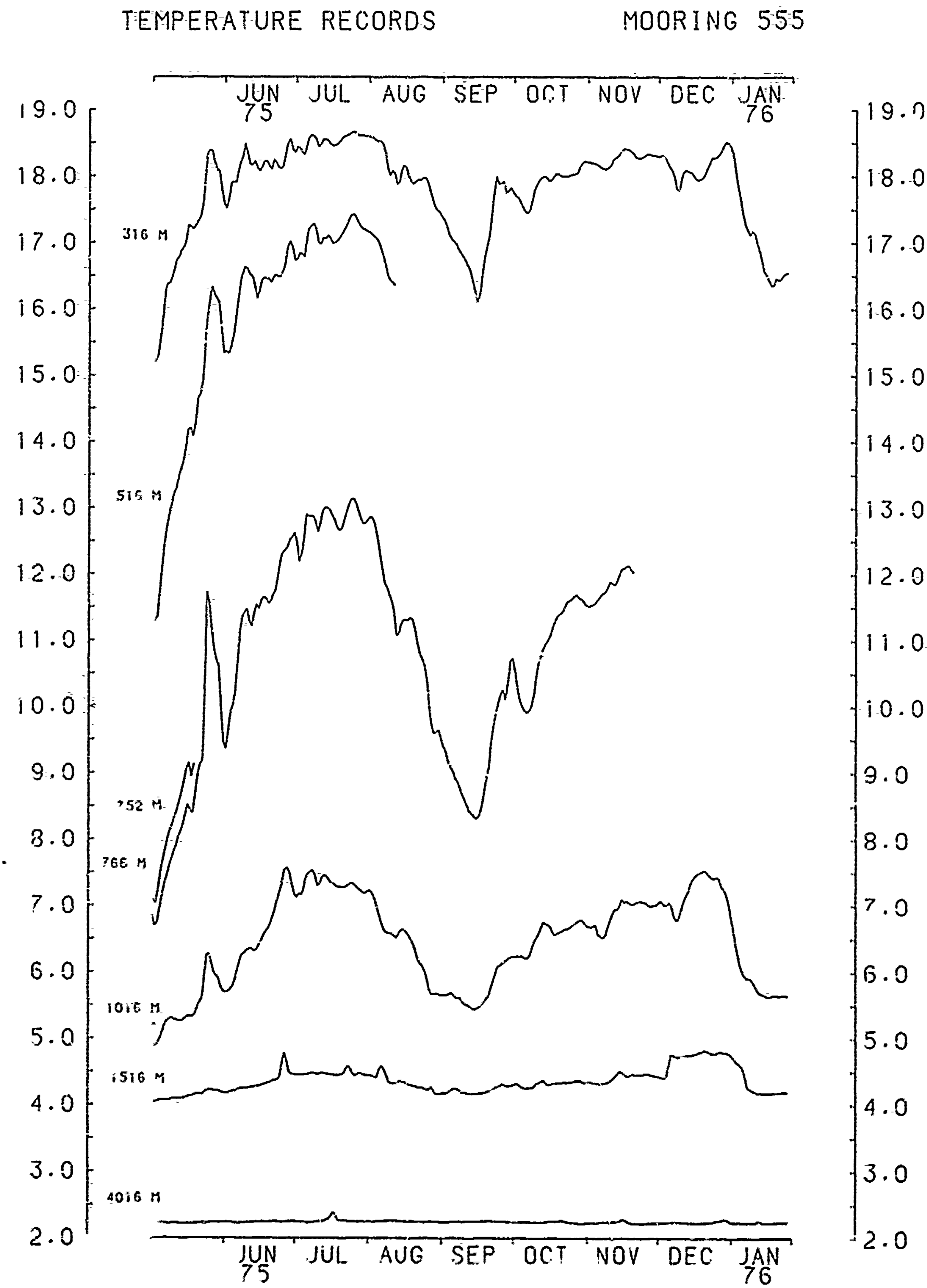

TEMPERATURE RECORDS
MOORING 555
JUN 75
JUL
AUG
SEP
OCT
NOV
DEC
JAN 76
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
316 M
515 M
752 M
766 M
1016 M
1516 M
4016 M

Figure 18

CURRENT VECTORS FOR MOORING 572

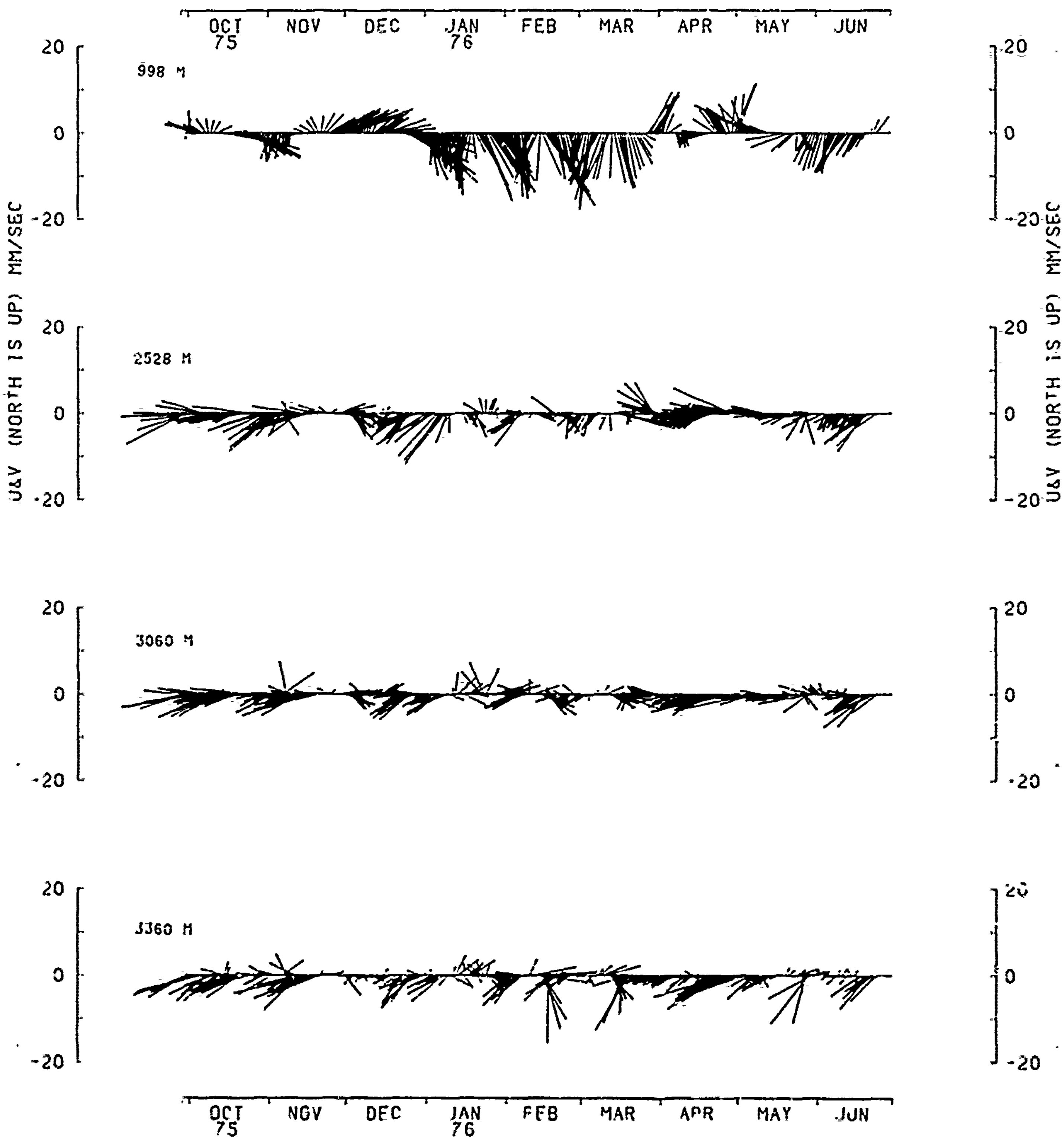


Figure 9

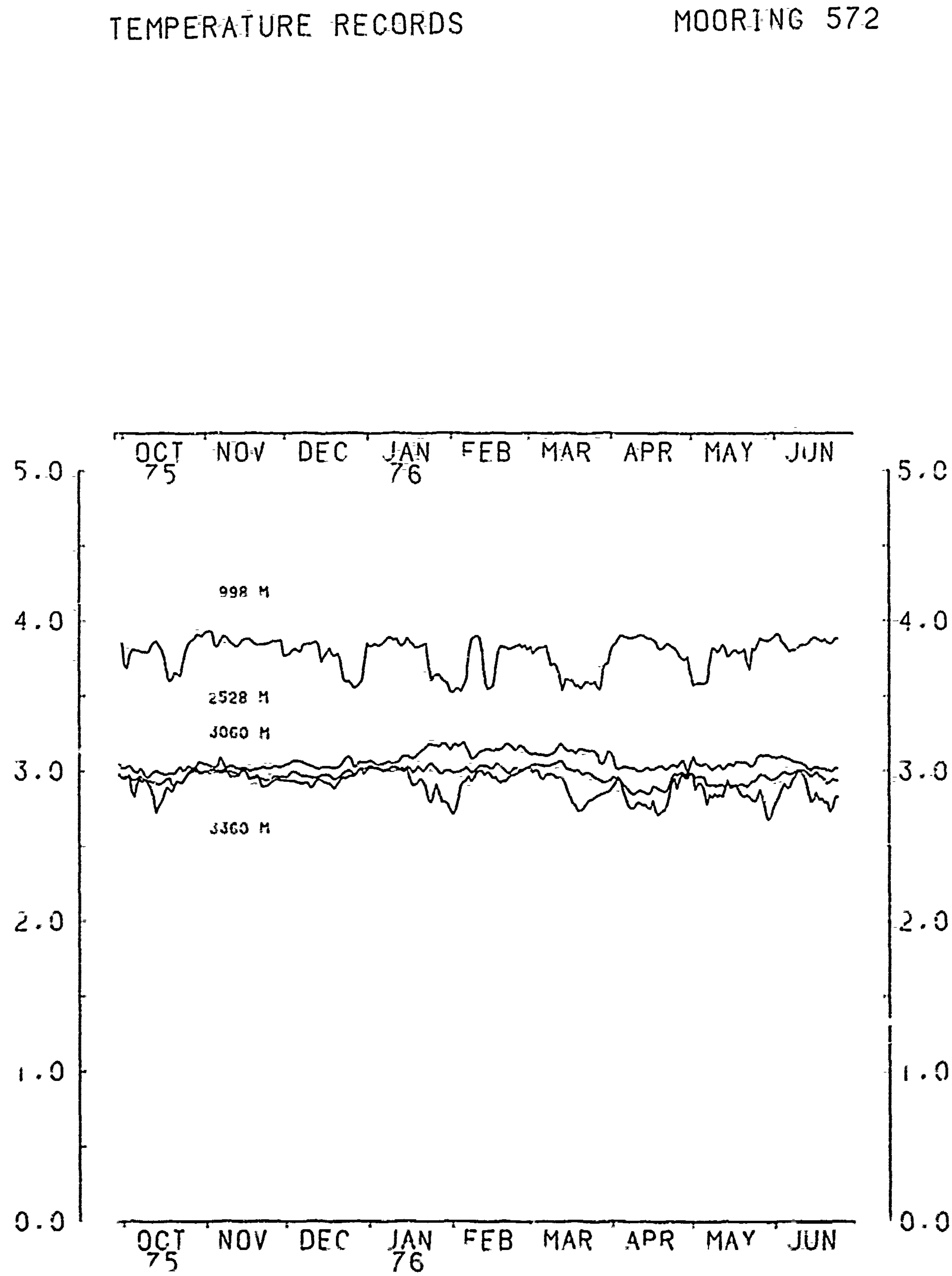
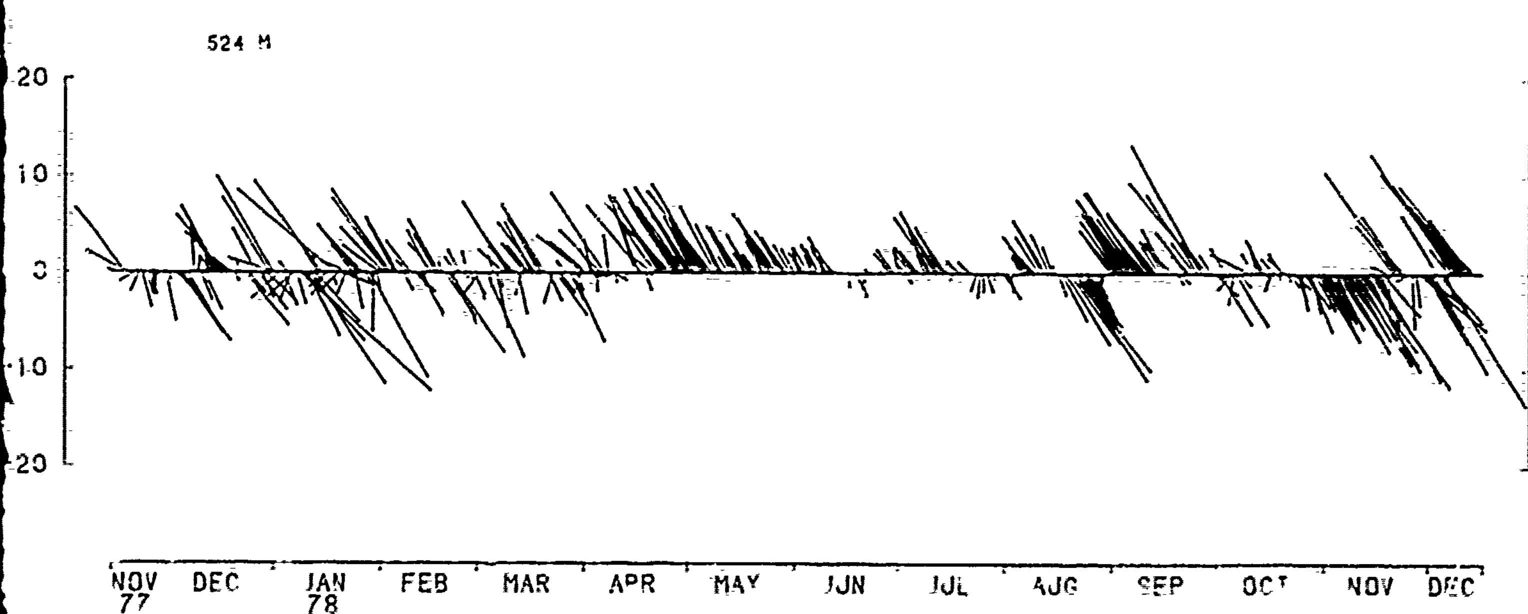

TEMPERATURE RECORDS
MOORING 572
OCT 75
NOV
DEC
JAN 76
FEB
MAR
APR
MAY
JUN
5.0
4.0
3.0
2.0
1.0
0.0
998 M
2528 M
3060 M
3360 M

Figure 12

CURRENT VECTORS FOR MOORING 635



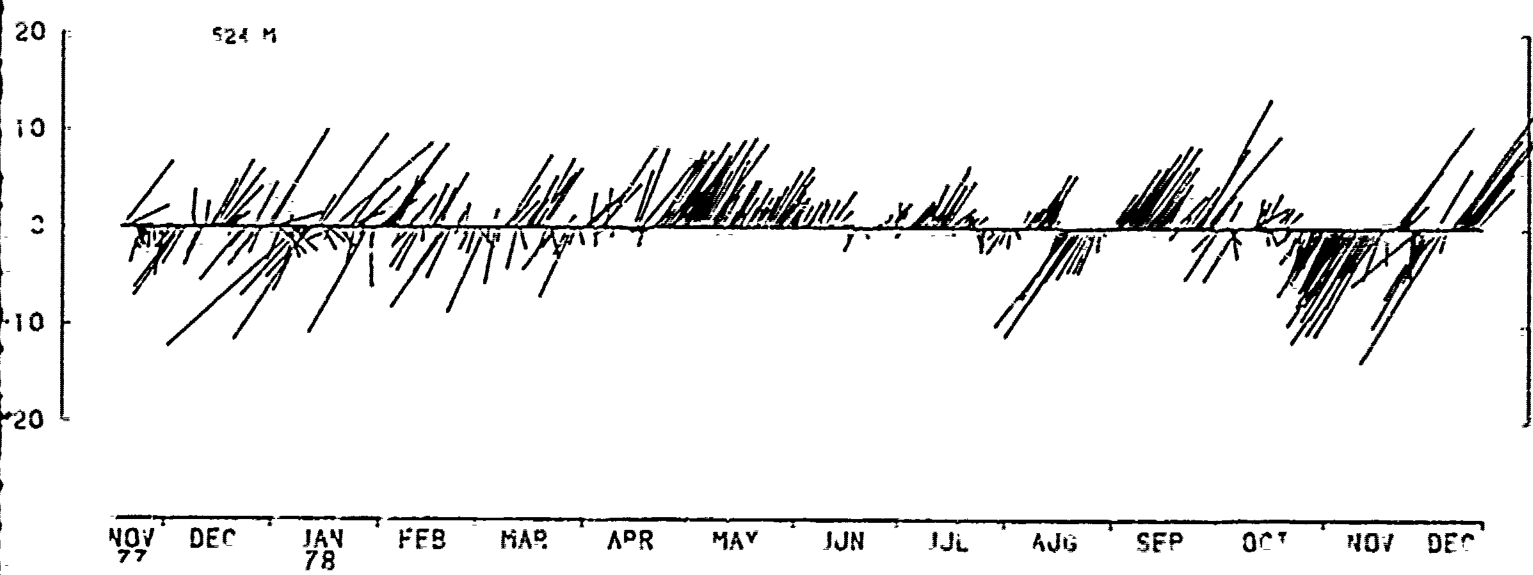
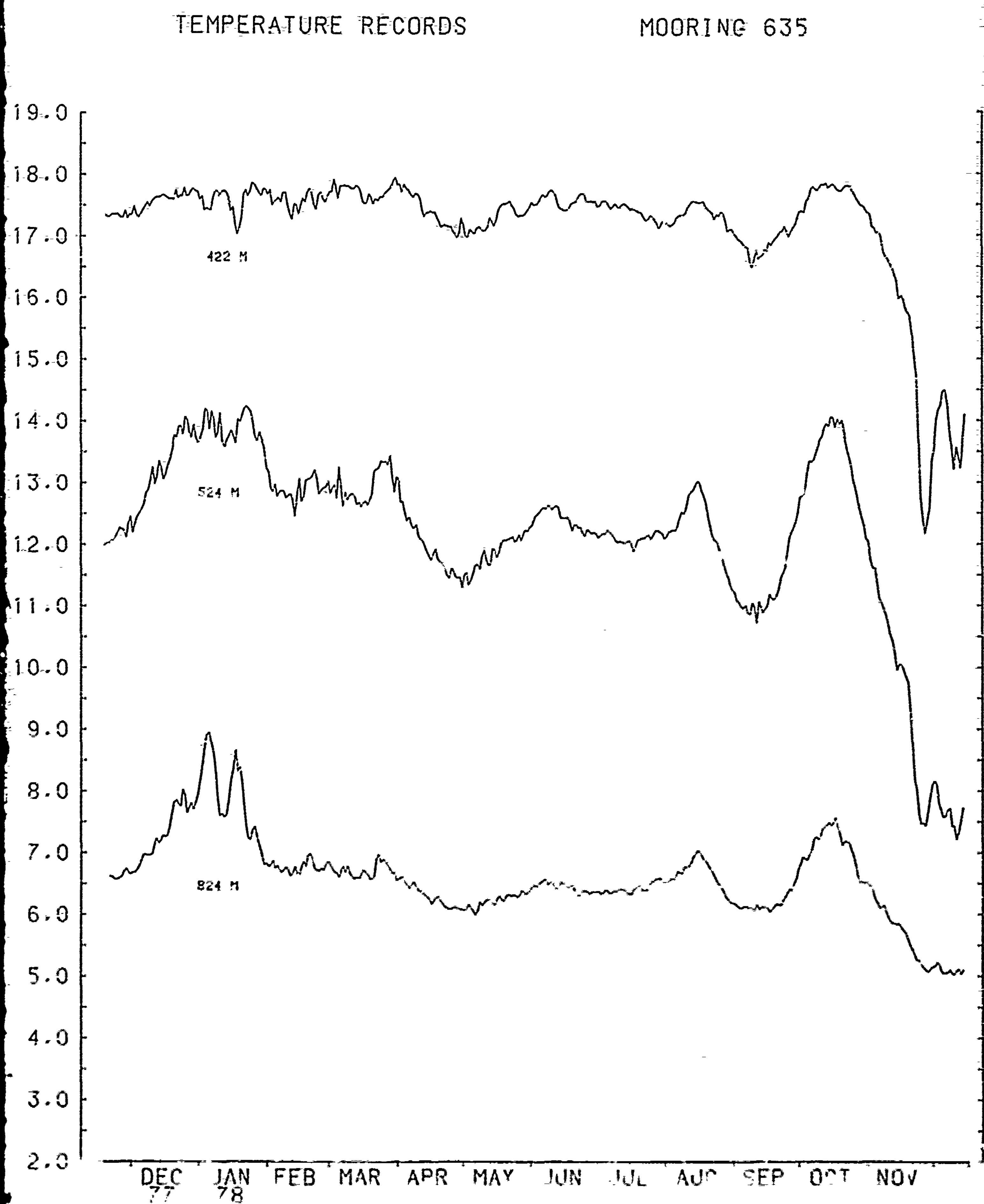


Figure 21



1-G-14

Figure 24

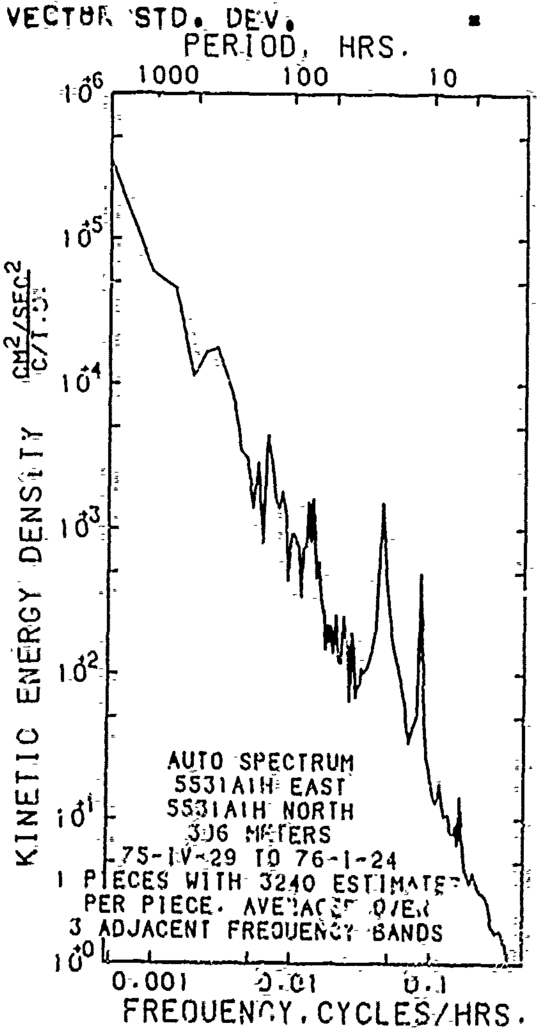
****
** 5531A1H ** 6538 POINTS FROM 75- IV -29 TO 76- I -26
INST. V-0183 DEPTH 306 M.

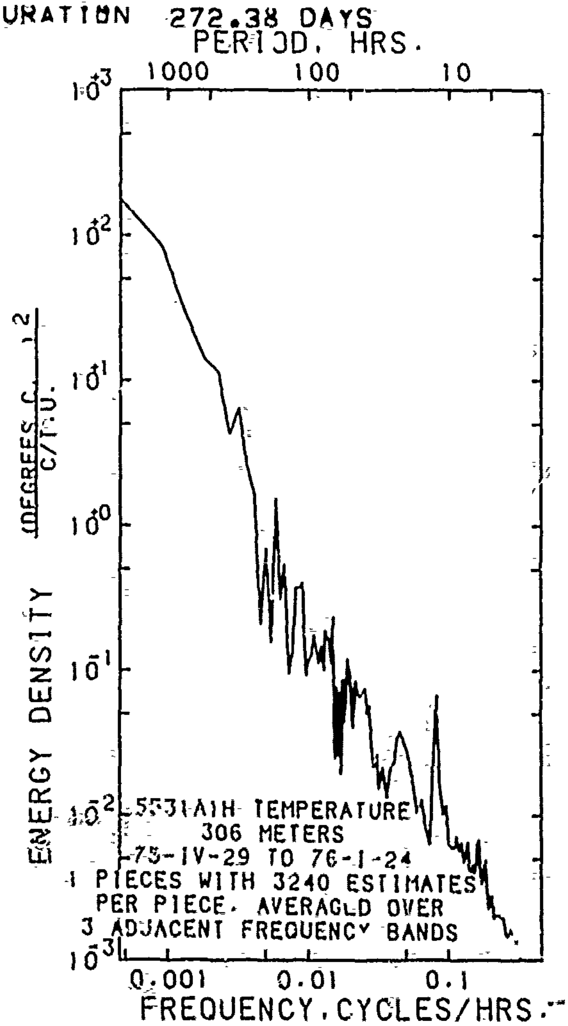
VARIABLE	EAST	NORTH	SPEED	TEMPERATURE
UNITS	MM/S	MM/S	MM/S	DEGREES C.
MEAN	-31.931	18.532	213.396	18.145
STD. ERR.	2.119	2.046	1.385	.567E-2
VARIANCE	29351.972	27365.655	12542.642	.210
STD. DEV.	171.324	165.426	111.994	.458
KURTOSIS	2.744	3.268	2.501	8.490
SKEWNESS	-.777E-1	.215	.462	-1.912
MINIMUM	-522.516	-489.876	2.846	15.843
MAXIMUM	402.526	495.907	561.533	18.846

****
EAST & NORTH
****

COVARIANCE	7042.348
STD. ERR. OF COVARIANCE	302.137
STD. DEV. OF COVARIANCE	24430.164
CORRELATION COEFFICIENT	.248
VECTOR MEAN	36.920
VECTOR VARIANCE	28358.813
VECTOR STD. DEV.	168.401

****
* SAMPLE SIZE = 6538 POINTS
*
* SPANNING RANGE
* FROM 75- IV -29 04.00.00
* TO 76- I -26 13.00.00
*
* DURATION 272.38 DAYS



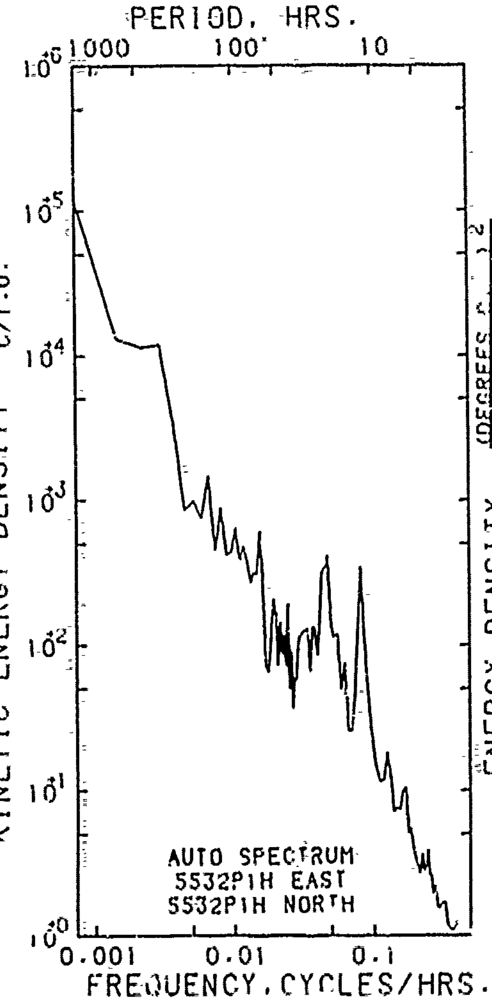


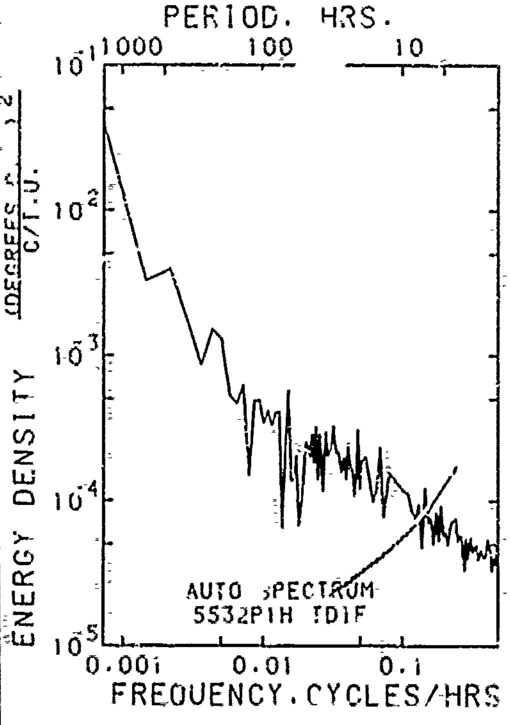
** 5532P1H	** 4079 POINTS FROM 75- IV -29 TO 75- X -15				
INST. DT-5106	DEPTH 506 M.				
VARIABLE *	EAST	NORTH	SPEED	TEMPERATURE	TDIF
UNITS *	MM/S	MM/S	MM/S	DEGREES C.	DEG. C.
MEAN =	.410	20.753	183.074	16.564	.131E-1
STD. ERR. =	2.590	1.779	1.328	.110E-1	.143E-3
VARIANCE =	27363.502	12912.912	7191.103	.490	.830E-4
STD. DEV. =	165.419	113.635	84.800	.700	.911E-2
KURTOSIS =	2.071	2.612	2.599	3.235	3.858
SKEWNESS =	-.208	-.247	.276	-.923	.534
MINIMUM =	-411.094	-395.810	1.844	14.376	-.155E-1
MAXIMUM =	336.132	278.320	439.973	17.872	.642E-1

EAST & NORTH

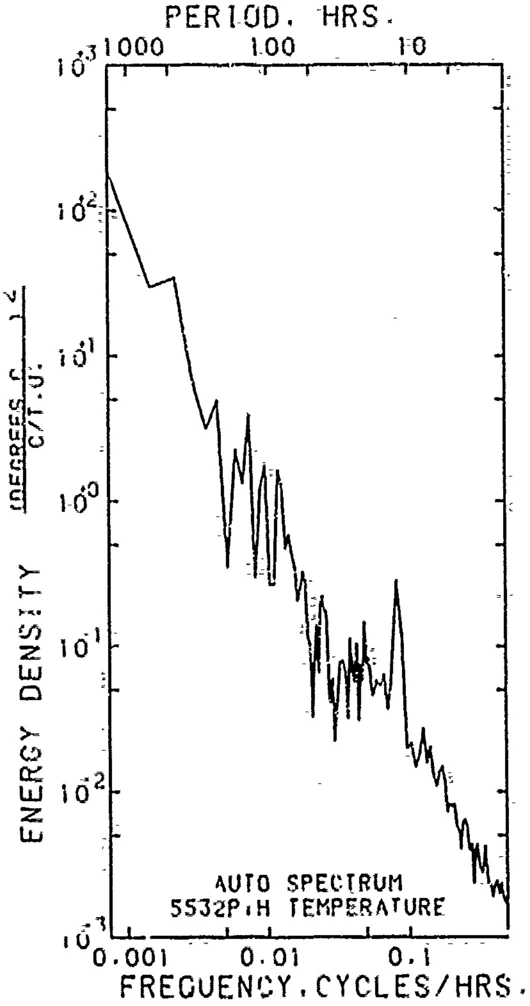
COVARIANCE =	2175.815
STD. ERR. OF COVARIANCE =	318.862
STD. DEV. OF COVARIANCE =	20364.787
CORRELATION COEFFICIENT =	.116
VECTOR MEAN =	20.757
VECTOR VARIANCE =	20138.207
VECTOR STD. DEV. =	141.909

* SAMPLE SIZE = 4079 POINTS
*
* SPANNING RANGE
* FROM 75- IV -29 01.37.30
* TO 75- X -15 23.37.30
*
* DURATI[illegible] 169.92 DAYS





506 METERS
75-IV-29 TO 75-X-14
1 PIECES WITH 2025 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS



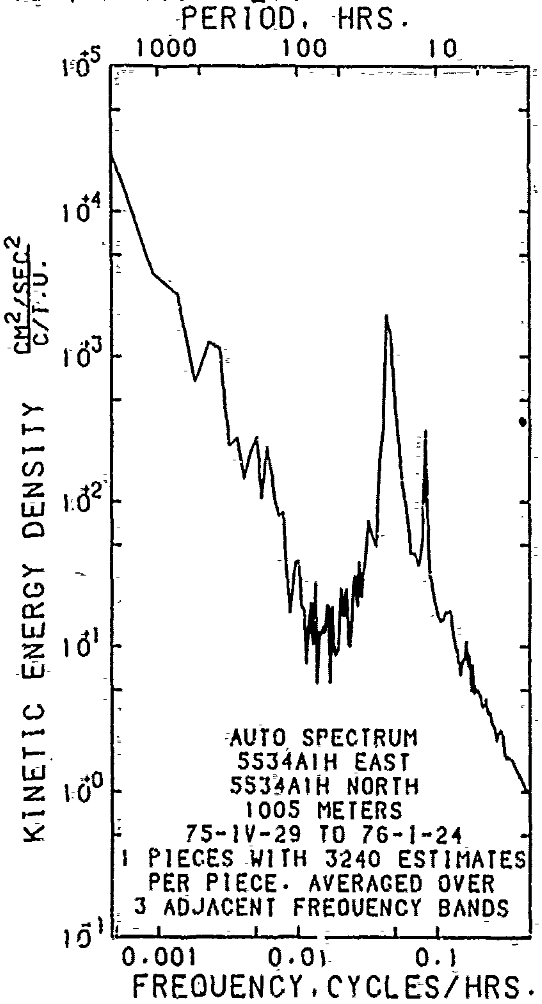
```
*****************************************************************
**  5534A1H    **  6538 POINTS   FROM 75- IV -29   TO 76-  I -26
    INST. V-0136   DEPTH 1005 M.
*****************************************************************
```

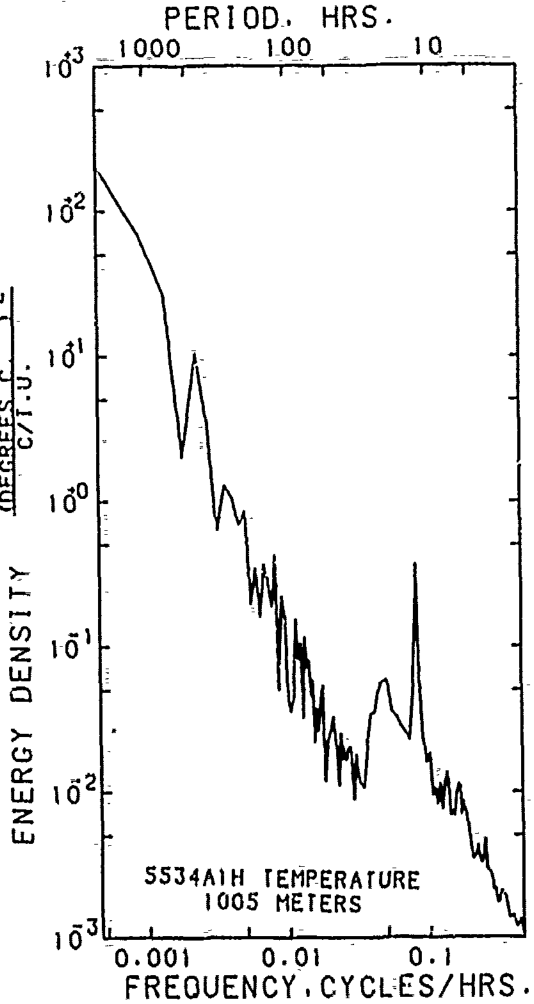
VARIABLE	*	EAST	NORTH	SPEED	TEMPERATURE
UNITS	*	MM/S	MM/S	MM/S	DEGREES C.
MEAN	=	-10.317	3.493	75.612	6.740
STD. ERR.	=	.782	.701	.496	.635E-2
VARIANCE	=	3999.645	3208.957	1610.044	.264
STD. DEV.	=	63.243	56.648	40.125	.514
KURTOSIS	=	2.728	3.342	3.041	2.902
SKEWNESS	=	.237E-1	.231	.699	.178
MINIMUM	=	-204.466	-190.015	1.175	5.683
MAXIMUM	=	194.928	228.960	245.272	8.167

```
************
EAST & NORTH
************
```

COVARIANCE	=	412.390
STD. ERR. OF COVARIANCE	=	46.252
STD. DEV. OF COVARIANCE	=	3739.860
CORRELATION COEFFICIENT	=	.115
VECTOR MEAN	=	10.892
VECTOR VARIANCE	=	3604.301
VECTOR STD. DEV.	=	60.036

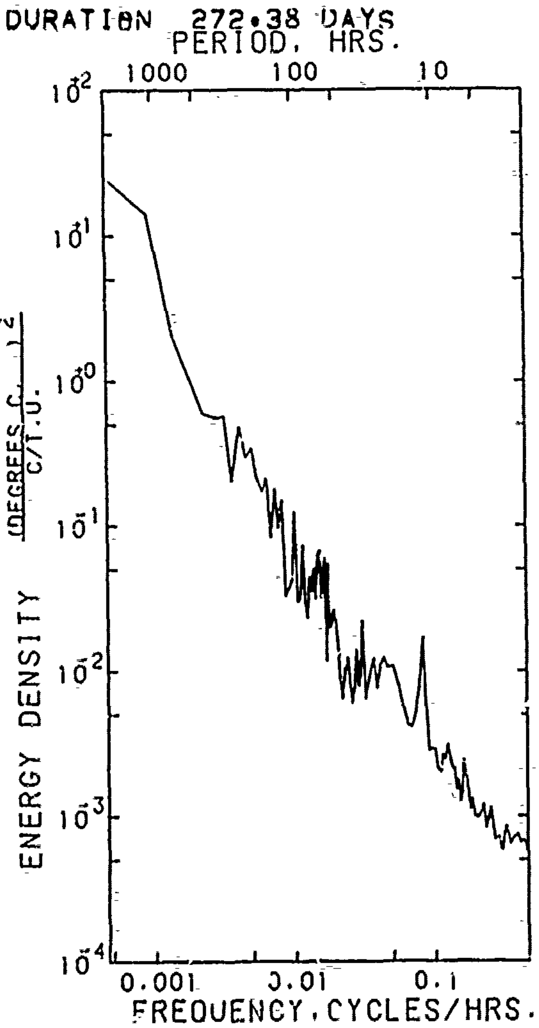
```
******************************
* SAMPLE SIZE =  6538 POINTS
*
* SPANNING RANGE
* FROM   75- IV -29   04.00.00
* TO     76-  I -26   13.00.00
*
* DURATION  272.38 DAYS
```





```
***********************************************************************
**  5535A1HTEMP  **   6538 POINTS   FROM 75- IV -29  TO 76-  I -26
      INST. T-0052   DEPTH 1505 M.
**************************
VARIABLE   *   TEMPERATURE
UNITS      *    DEGREES C.
**************************
MEAN           *          4.504
STD. ERR.      *           .192E-2
VARIANCE       *           .241E-1
STD. DEV.      *           .155
KURTOSIS       *          2.335
SKEWNESS       *          -.145
MINIMUM        *          4.066
MAXIMUM        *          4.849


****************************************
* SAMPLE SIZE *   6538 POINTS
*
* SPANNING RANGE
* FROM   75- IV -29   03.30.42
* TO     76-  I -26   12.30.42
*
* DURATION   272.38 DAYS
```



AUTO SPECTRUM
5535A1HTEMP TEMPERATURE
1505 METERS
75-IV-29 TO 76-I-24
1 PIECES WITH 3240 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

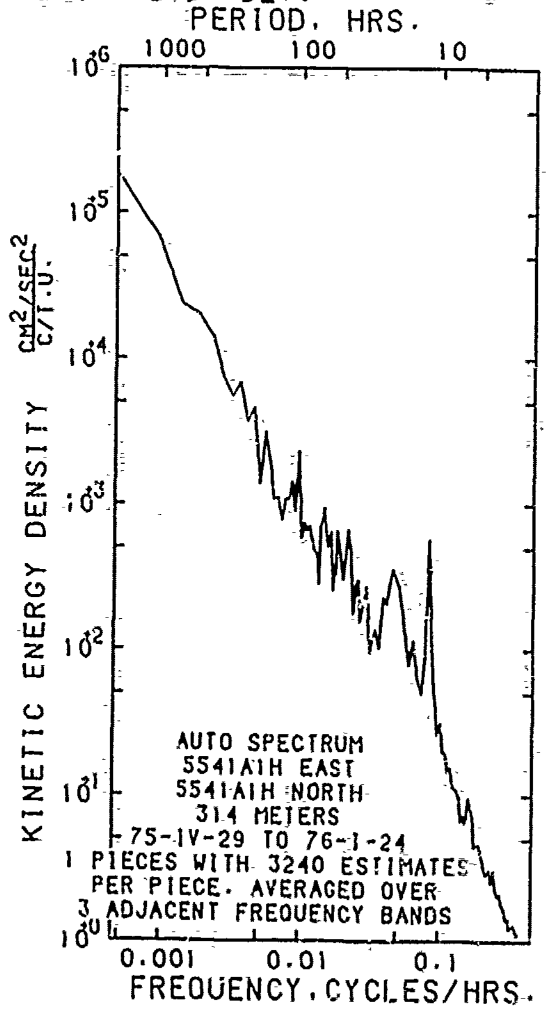
****
** 5541A1H ** 6510 POINTS FROM 75- IV -29 TO 76- I -26
INST. V-0131 DEPTH 314 M.

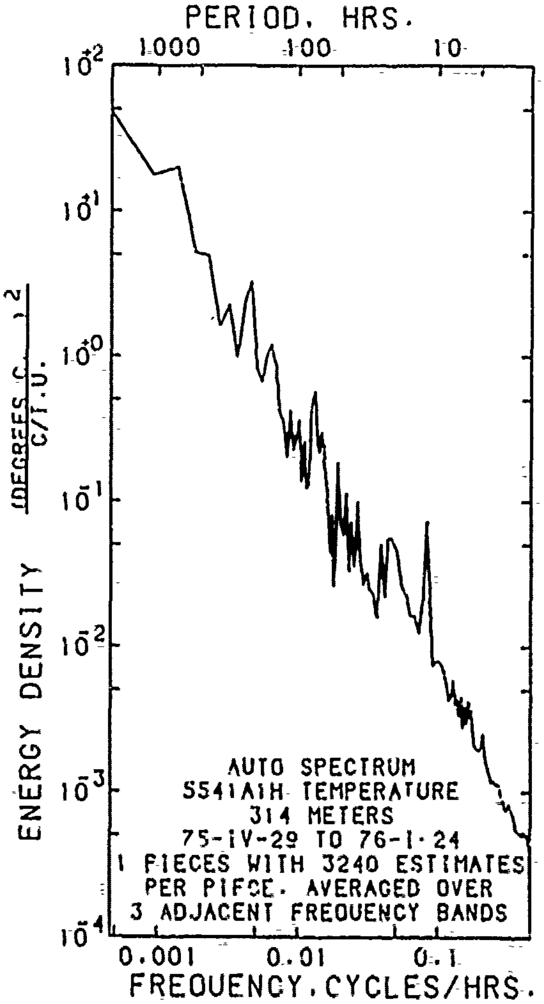
VARIABLE *	EAST	NORTH	SPEED	TEMPERATURE
UNITS *	MM/S	MM/S	MM/S	DEGREES C.
MEAN =	22.117	-55.866	202.639	18.289
STD. ERR. =	1.824	1.935	1.148	.368E-2
VARIANCE =	21665.770	24365.303	8578.635	.883E-1
STD. DEV. =	147.193	156.094	92.621	.297
KURTOSIS =	3.766	2.190	3.391	3.425
SKEWNESS =	-.405	.116	.504	-.693
MINIMUM =	-522.638	-427.856	5.974	16.976
MAXIMUM =	485.418	518.449	696.074	18.929

****
EAST & NORTH
****

COVARIANCE	=	5741.169
STD. ERR. OF COVARIANCE	=	269.821
STD. DEV. OF COVARIANCE	=	21770.377
CORRELATION COEFFICIENT	=	.250
VECTOR MEAN	=	60.084
VECTOR VARIANCE	=	23015.536
VECTOR STD. DEV.	=	151.709

****
* SAMPLE SIZE = 6510 POINTS
*
* SPANNING RANGE
* FROM 75- IV -29 22.00.00
* TO 76- I -26 03.00.00
*
* DURATION 271.21 DAYS



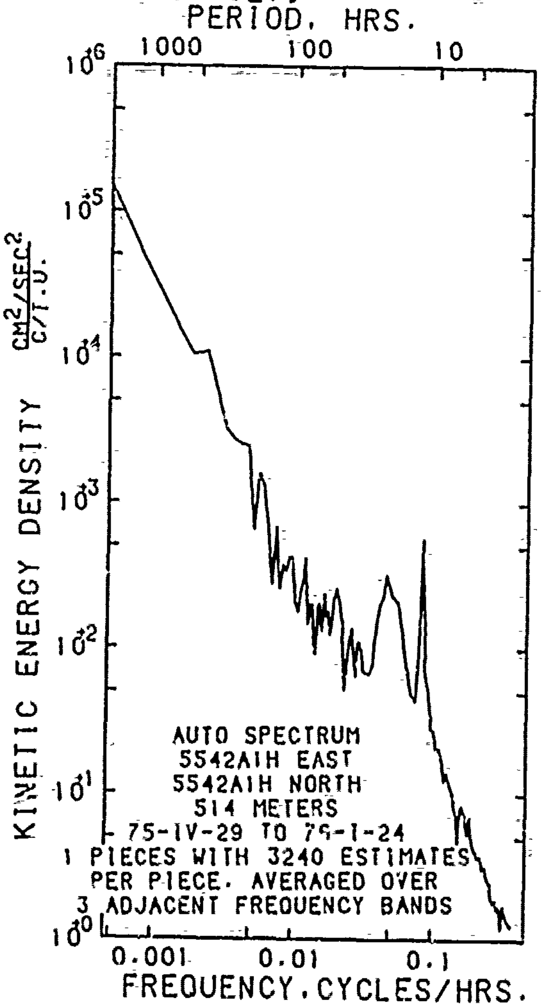


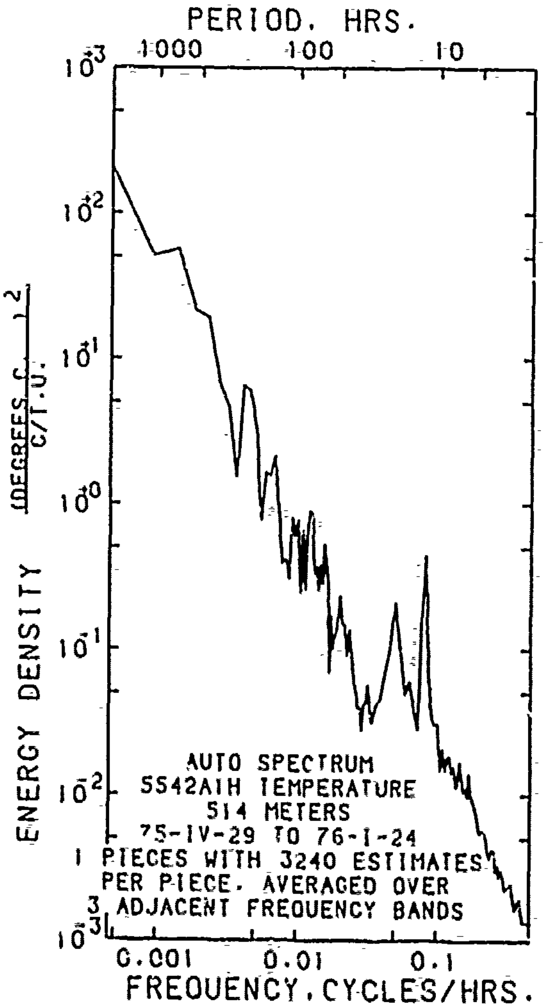
```
*********************************************************************
** 5542A1H     ** 6510 POINTS FROM 75- IV -29  TO 76-  I -26
   INST. V-0106   DEPTH  514 M.
```

VARIABLE *	EAST	NORTH	SPEED	TEMPERATURE
UNITS *	MM/S	MM/S	MM/S	DEGREES C.
MEAN *	8.982	-44.652	166.785	16.621
STD. ERR. *	1.418	1.660	.902	.743E-2
VARIANCE *	13094.031	17949.513	5300.914	.359
STD. DEV. *	114.429	133.976	72.807	.600
KURTOSIS *	3.259	1.990	3.095	4.290
SKEWNESS *	-.440	.940E-1	.275	-.876
MINIMUM *	-406.235	-354.007	4.369	13.883
MAXIMUM *	285.636	364.985	461.469	17.808

```
************
EAST & NORTH
************
COVARIANCE                        *      6077.522
STD. ERR. OF COVARIANCE           *       173.267
STD. DEV. OF COVARIANCE           *     13979.985
CORRELATION COEFFICIENT           *          .396
VECTOR MEAN                       *        45.547
VECTOR VARIANCE                   *     15521.772
VECTOR STD. DEV.                  *       124.586

***************************
* SAMPLE SIZE *  6510 POINTS
*
* SPANNING RANGE
* FROM  75- IV -29  22.00.00
* TO    76-  I -26  03.00.00
*
* DURATION  271.21 DAYS
```





****

** 5544A1H ** 6510 POINTS FROM 75- IV -29 TO 76- I -26

INST. V-0180 DEPTH 1013 M.

VARIABLE *	EAST	NORTH	SPEED	TEMPERATURE
UNITS *	MM/S	MM/S	MM/S	DEGREES C.
MEAN =	-16.225	-20.294	87.306	7.046
STD. ERR. =	.779	.891	.577	.864E-2
VARIANCE =	3947.889	5164.897	2165.536	.486
STD. DEV. =	62.832	71.867	46.535	.697
KURTOSIS =	3.199	2.689	3.378	2.234
SKEWNESS =	-.317	-.202	.778	.484
MINIMUM =	-244.846	-269.253	3.220	5.819
MAXIMUM =	154.463	179.944	277.657	8.929

****

EAST & NORTH

****

COVARIANCE	=	1473.676
STD. ERR. OF COVARIANCE	=	56.699
STD. DEV. OF COVARIANCE	=	4574.746
CORRELATION COEFFICIENT	=	.326
VECTOR MEAN	=	25.983
VECTOR VARIANCE	=	4556.393
VECTOR STD. DEV.	=	67.501

****

* SAMPLE SIZE = 6510 POINTS

*

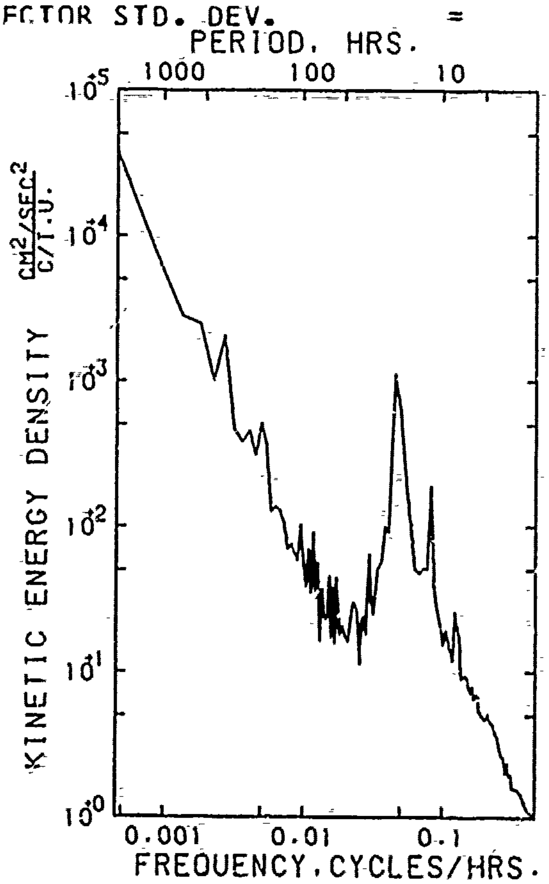
* SPANNING RANGE

* FROM 75- IV -29 22.00.00

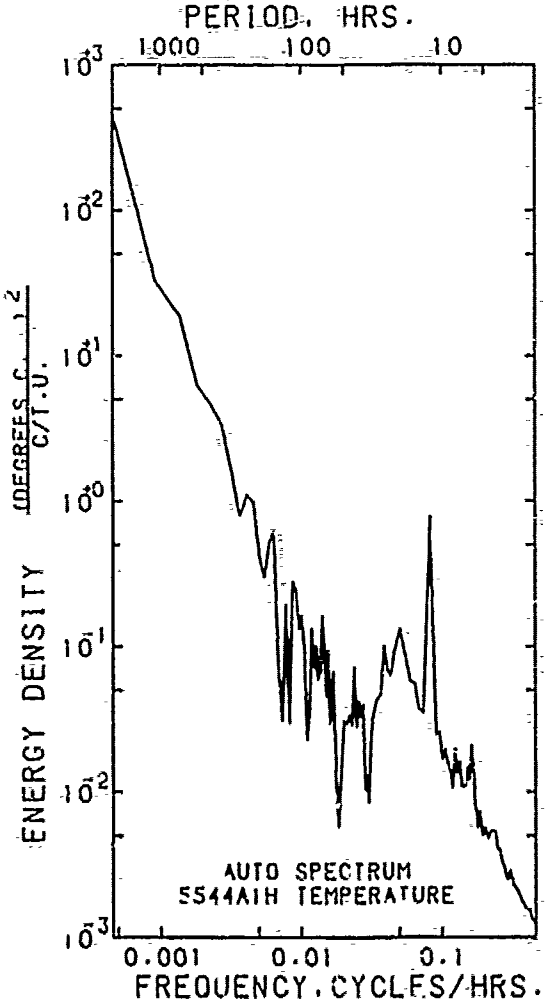
* TO 76- I -26 03.00.00

*

* DURATION 271.21 DAYS



AUTO SPECTRUM
5544A1H EAST
5544A1H NORTH
1013 METERS
75-IV-29 TO 76-I-24
1 PIECES WITH 3240 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
5544A1H TEMPERATURE

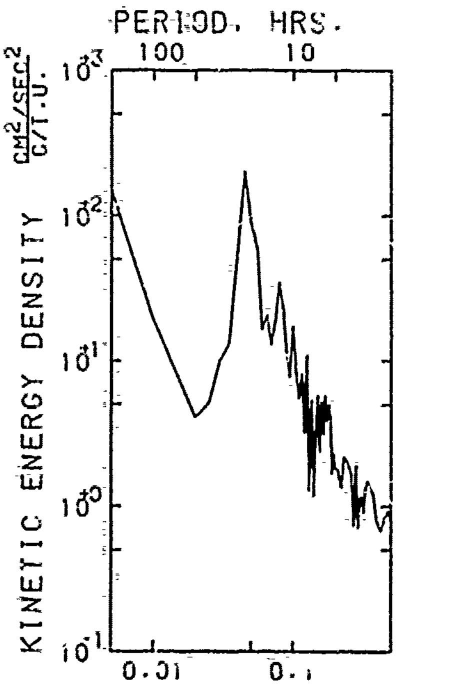
** 5545A1H ** 627 POINTS FROM 75- IV -29 TO 75- V -25
INST. M-260T DEPTH 1513 M.

VARIABLE * UNITS *	EAST COMP MM/SEC	NORTH COMP MM/SEC	SPEED MM/SEC	TEMPERATURE DEGREES C.
MEAN =	-22.391	-6.521	39.220	4.275
STD. ERR. =	1.345	.799	.928	.175E-2
VARIANCE =	1134.416	399.788	539.902	.193E-2
STD. DEV. =	33.681	19.995	23.236	.439E-1
KURTOSIS =	2.748	3.702	3.126	3.882
SKEWNESS =	-.303	-.495	.975	1.050
MINIMUM =	-113.783	-81.405	17.276	4.188
MAXIMUM =	74.032	56.108	114.333	4.437

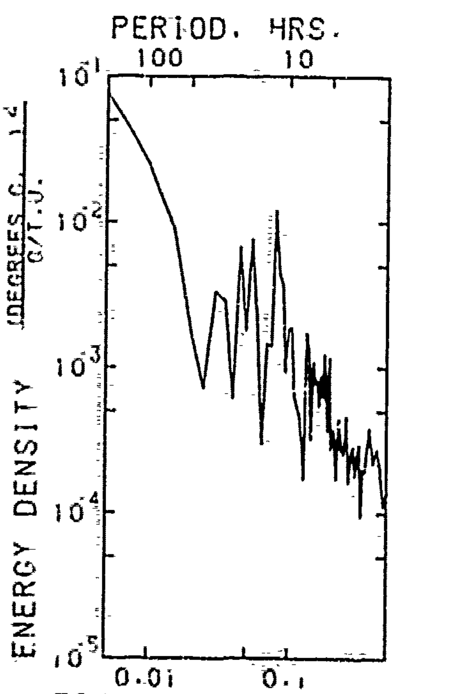
EAST COMP & NORTH COMP

COVARIANCE	=	-216.981
STD. ERR. OF COVARIANCE	=	30.071
STD. DEV. OF COVARIANCE	=	752.975
CORRELATION COEFFICIENT	=	-.322
VECTOR MEAN	=	23.321
VECTOR VARIANCE	=	767.102
VECTOR STD. DEV.	=	27.697

* SAMPLE SIZE = 627 POINTS
*
* SPANNING RANGE
* FROM 75- IV -29 21.30.42
* TO 75- V -25 23.30.42
*
* DURATION 26.08 DAYS



AUTO SPECTRUM
5545A1H EAST COMP
5545A1H NORTH COMP
1513 METERS
75-IV-29 TO 75-V-24
1 PIECES WITH 300 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
5545A1H TEMPERATURE
1513 METERS
75-IV-29 TO 75-V-24
1 PIECES WITH 300 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

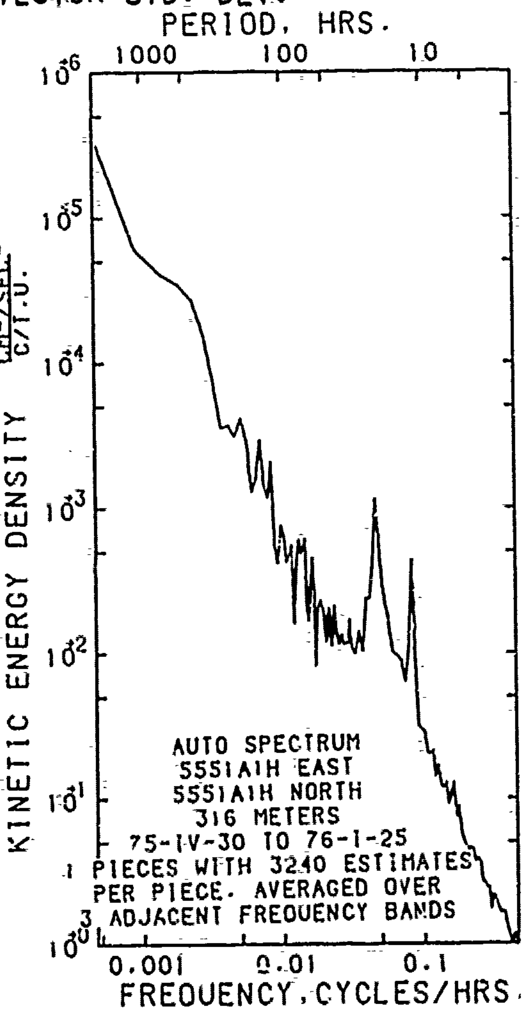
** 5551A1H ** 6488 POINTS FROM 75- IV -30 TO 76- I -25
INST. V-0111 DEPTH 316 M.

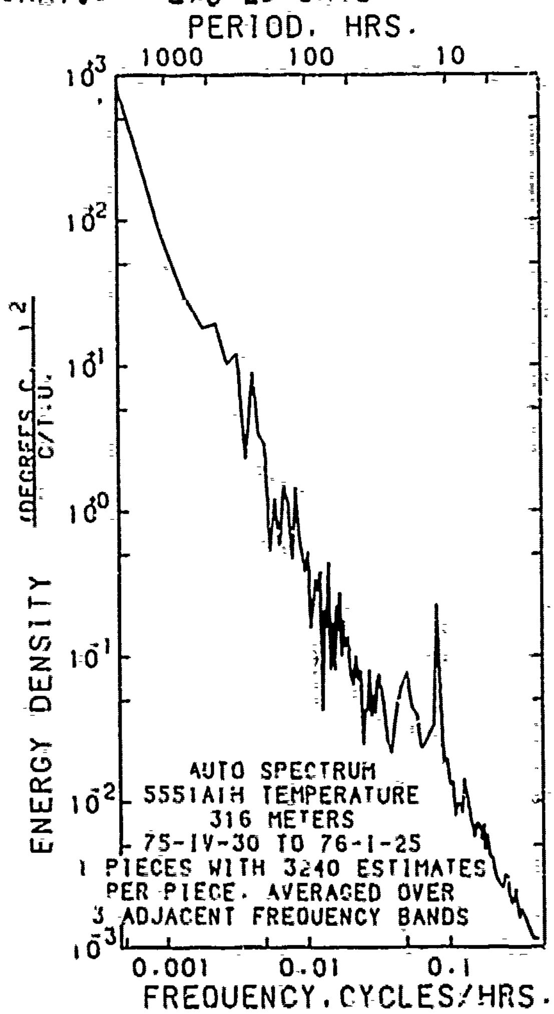
VARIABLE	EAST	NORTH	SPEED	TEMPERATURE
UNITS	MM/S	MM/S	MM/S	DEGREES C.
MEAN	73.461	-32.533	256.881	17.817
STD. ERR.	2.280	2.616	1.692	.892E-2
VARIANCE	33733.439	44384.154	18584.638	.517
STD. DEV.	183.667	210.675	136.325	.719
KURTOSIS	2.445	2.470	1.944	4.210
SKEWNESS	.633	-.244	.133	-1.289
MINIMUM	-289.179	-594.268	4.758	14.783
MAXIMUM	595.212	511.112	614.104	18.731

EAST & NORTH

COVARIANCE	5083.815
STD. ERR. OF COVARIANCE	413.015
STD. DEV. OF COVARIANCE	33267.586
CORRELATION COEFFICIENT	.131
VECTOR MEAN	80.343
VECTOR VARIANCE	39058.797
VECTOR STD. DEV.	197.633

* SAMPLE SIZE = 6488 POINTS
* SPANNING RANGE
* FROM 75- IV -30 11.00.00
* TO 76- I -25 18.00.00
* DURATION 270.29 DAYS





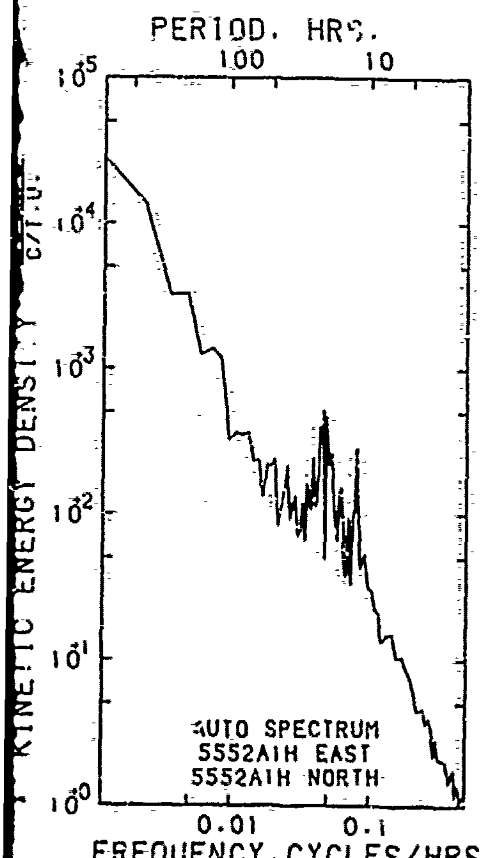
****
**. 5552A1H ** 2491 POINTS FROM 75- IV -30 TO 75-VIII-12
INST. DT-5107 DEPTH 516 M.

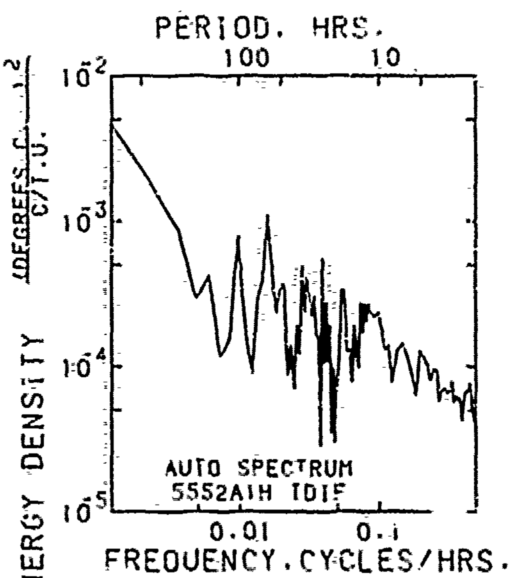
VARIABLE *	EAST	NORTH	SPEED	TEMPERATURE	TDIF
UNITS *	MM/S	MM/S	MM/S	DEGREES C.	DEG. C.
MEAN =	188.083	-6.134	253.461	15.915	.198E-1
STD. ERR. =	2.474	2.396	1.877	.319E-1	.194E-3
VARIANCE =	15243.364	22359.266	8772.938	2.527	.933E-4
STD. DEV. =	123.464	149.530	93.664	1.590	.966E-2
KURTOSIS =	2.332	2.393	2.691	4.102	4.479
SKEWNESS =	-.239	-.176	-.322	-1.454	1.002
MINIMUM =	-126.096	-414.125	7.816	10.656	-.226E-2
MAXIMUM =	557.268	335.092	559.182	17.625	.679E-1

****
EAST & NORTH
****

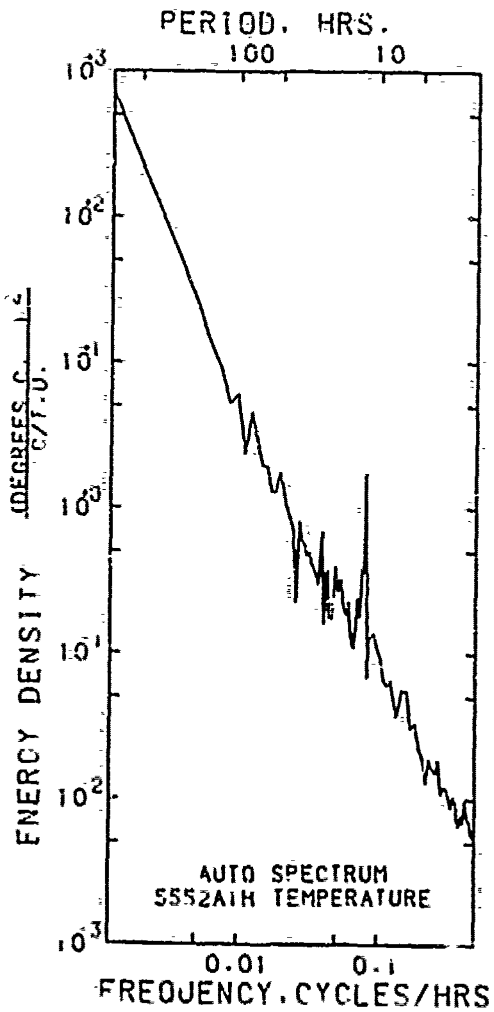
* DURATION 103.75 DAYS

COVARIANCE	=	6645.988
STD. ERR. OF COVARIANCE	=	545.209
STD. DEV. OF COVARIANCE	=	27211.323
CORRELATION COEFFICIENT	=	.363
VECTOR MEAN	=	188.183
VECTOR VARIANCE	=	18801.315
VECTOR STD. DEV.	=	137.118





516 METERS
75-IV-30 TO 75-VIII-09
1 PIECES WITH 1215 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS



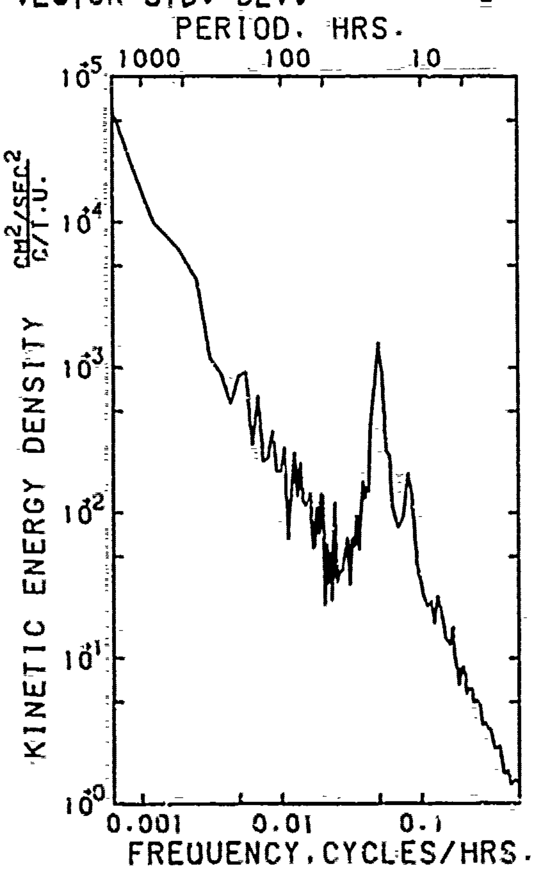
****
** 5554A1H ** 4946 POINTS FROM 75- IV -29 TO 75- XI -21
INST. D75115 DEPTH 766 M.

VARIABLE *	EAST	NORTH	SPEED	TEMPERATURE
UNITS *	MM/S	MM/S	MM/S	DEGREES C.
MEAN =	41.254	-4.027	138.835	10.828
STD. ERR. =	1.469	1.498	.923	.231E-1
VARIANCE =	10669.758	11100.832	4213.462	2.629
STD. DEV. =	103.295	105.360	64.911	1.621
KURTOSIS =	2.346	2.443	2.562	2.513
SKEWNESS =	.353	-.115	.323	-.620
MINIMUM =	-222.006	-300.759	3.009	6.453
MAXIMUM =	349.487	278.126	372.149	13.442

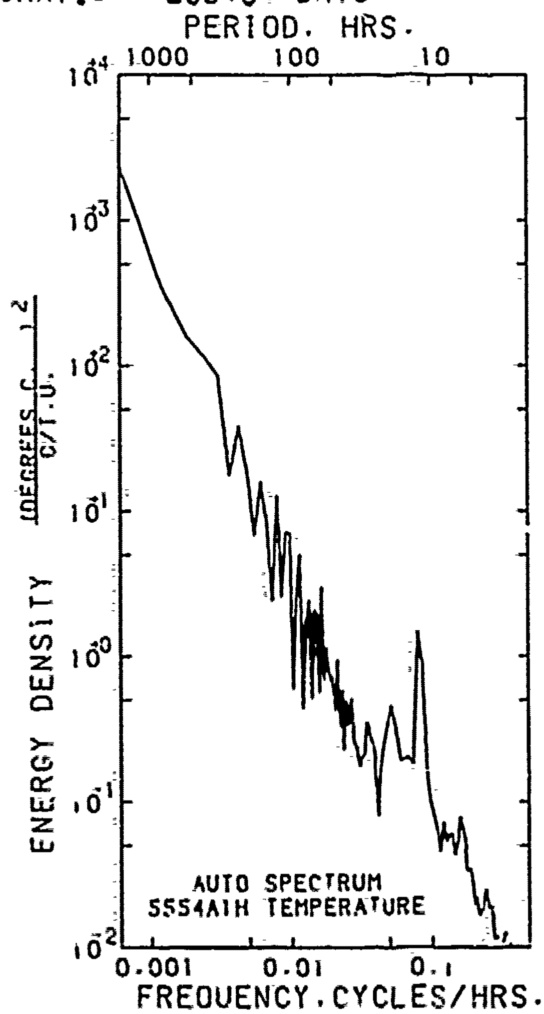
****
EAST & NORTH
****

COVARIANCE =	1824.792
STD. ERR. OF COVARIANCE =	142.401
STD. DEV. OF COVARIANCE =	10014.749
CORRELATION COEFFICIENT =	.168
VECTOR MEAN =	41.450
VECTOR VARIANCE =	10885.295
VECTOR STD. DEV. =	104.333

****
* SAMPLE SIZE = 4946 POINTS
*
* SPANNING RANGE
* FROM 75- IV -29 22.00.00
* TO 75- XI -21 23.00.00
*
* DURATION 206.04 DAYS



AUTO SPECTRUM
5554A1H EAST
5554A1H NORTH
766 METERS
75-IV-29 TO 75-XI-18
1 PIECES WITH 2430 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS



** 5555A1H ** 6488 POINTS FROM 75- IV -30 TO 76- I -25
INST. V-0193 DEPTH 1016 M.

VARIABLE	EAST	NORTH	SPEED	TEMPERATURE
UNITS	MM/S	MM/S	MM/S	DEGREES C.
MEAN	7.258	-9.018	74.478	6.4[illegible]
STD. ERR.	.711	.719	.433	.881E-2
VARIANCE	3278.644	3353.136	1218.795	.504
STD. DEV.	57.259	57.906	34.911	.710
KURTOSIS	2.579	2.599	2.920	1.939
SKEWNESS	.166	-.145	.496	-.222
MINIMUM	-197.367	-185.570	1.611	4.816
MAXIMUM	174.425	179.391	201.911	7.929

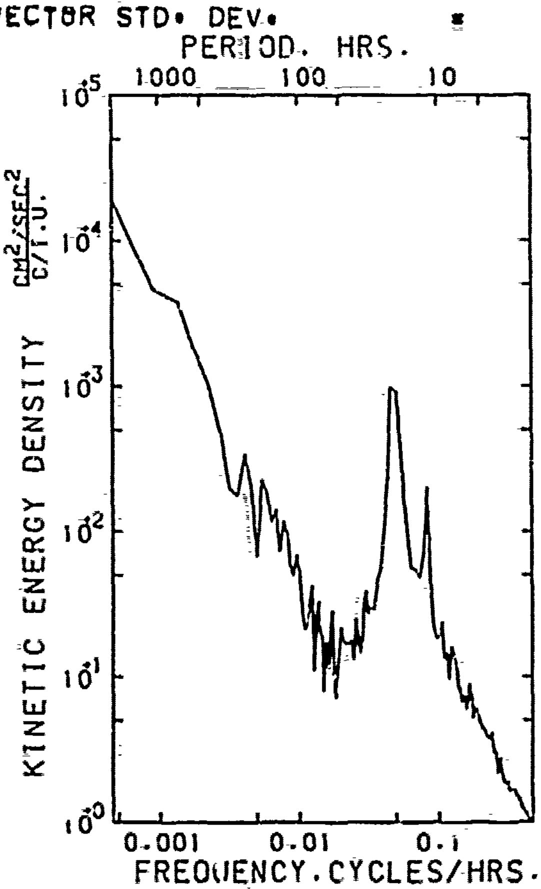
EAST & NORTH

COVARIANCE	=	104.270
STD. ERR. OF COVARIANCE	=	39.657
STD. DEV. OF COVARIANCE	=	3194.299
CORRELATION COEFFICIENT	=	.314E-1
VECTOR MEAN	=	11.576
VECTOR VARIANCE	=	3315.890
VECTOR STD. DEV.	=	57.584

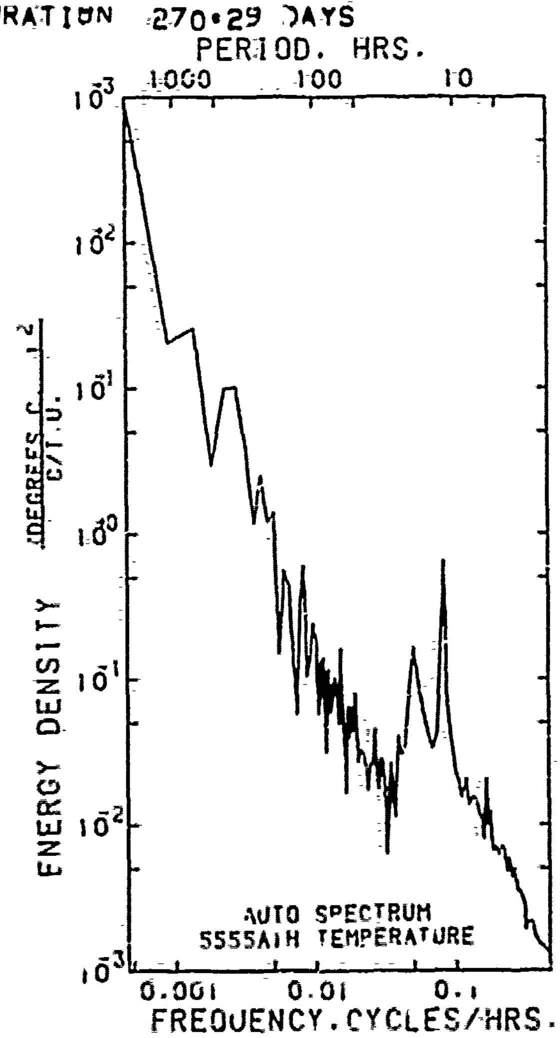
SAMPLE SIZE = 6488 POINTS

SPANNING RANGE
FROM 75- IV -30 11.00.00
TO 76- I -25 18.00.00

DURATION 270.29 DAYS



AUTO SPECTRUM
5555A1H EAST
5555A1H NORTH
1016 METERS
75-IV-30 TO 76-1-25
1 PIECES WITH 3240 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS



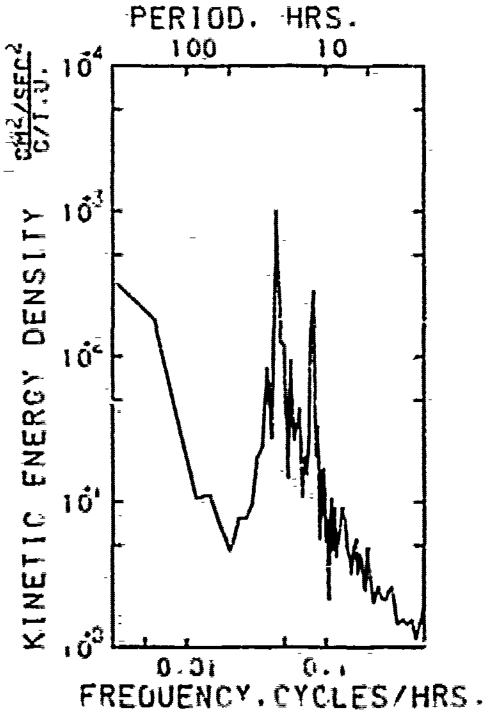
****
** 5556B1H ** 1046 POINTS FROM 75- IV -30 TO 75- VI -12
INST. M-271T DEPTH 1516 M.

VARIABLE *	EAST COMP	NORTH COMP	SPEED	TEMPERATURE
UNITS *	MM/SEC	MM/SEC	MM/SEC	DEGREES C.
MEAN =	45.695	-6.169	58.285	4.163
STD. ERR. =	.990	.982	.853	.224E-2
VARIANCE =	1024.345	1008.533	761.758	.523E-2
STD. DEV. =	32.005	31.757	27.600	.723E-1
KURTOSIS =	2.916	3.010	2.740	1.875
SKEWNESS =	-.357E-1	-.472	.495	-.482E-1
MINIMUM =	-58.741	-131.916	17.695	4.010
MAXIMUM =	134.834	89.692	153.333	4.311

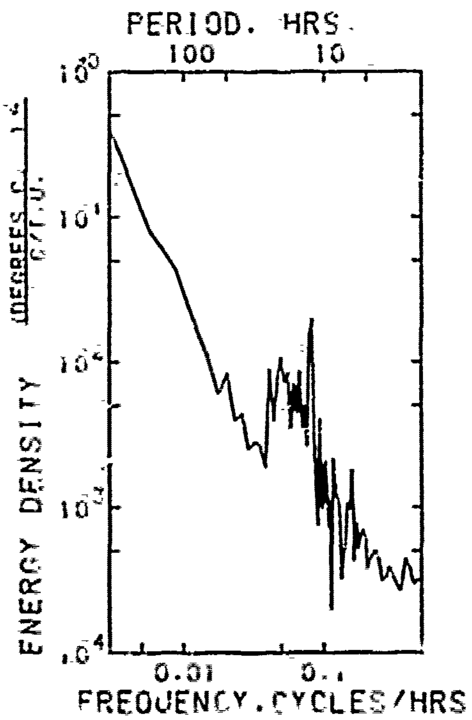
****
EAST COMP & NORTH COMP
****

COVARIANCE	=	-107.527
STD. ERR. OF COVARIANCE	=	58.153
STD. DEV. OF COVARIANCE	=	1880.782
CORRELATION COEFFICIENT	=	-.106
VECTOR MEAN	=	46.109
VECTOR VARIANCE	=	1016.439
VECTOR STD. DEV.	=	31.882

****
* SAMPLE SIZE = 1046 POINTS
*
* SPANNING RANGE
* FROM 75- IV -30 10.30.42
* TO 75- VI -12 23.30.42
*
* DURATION 43.54 DAYS



AUTO SPECTRUM
5556B1H EAST COMP
5556B1H NORTH COMP
1516 METERS
75-IV-30 TO 75-VI-12
1 PIECES WITH 512 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
5556B1H TEMPERATURE
1516 METERS
75-IV-30 TO 75-VI-12
1 PIECES WITH 512 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

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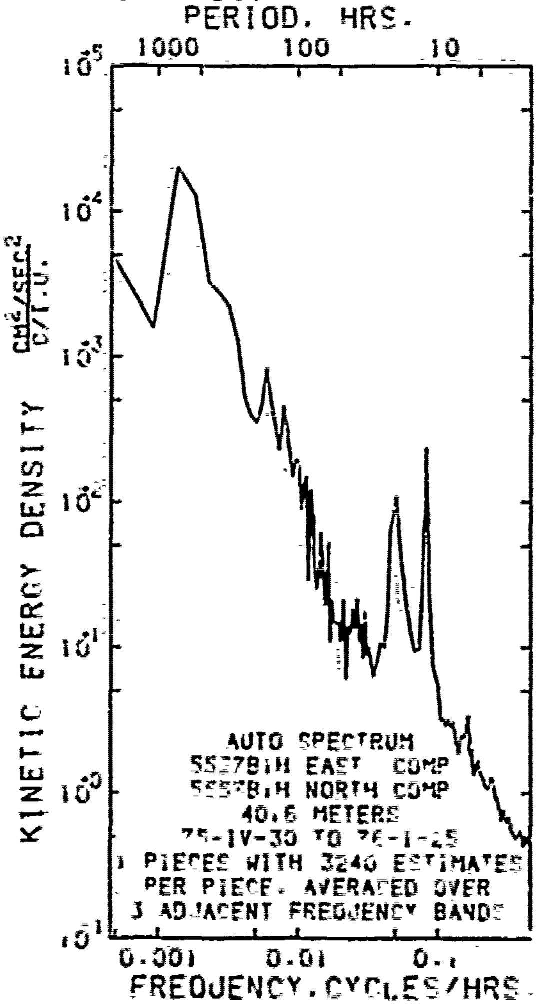
****************************************************************
**  5557B1H     **  6488 POINTS  FROM 75- IV -30  TO 76-  I -25
    INST. M-274T   DEPTH 4016 M.
```

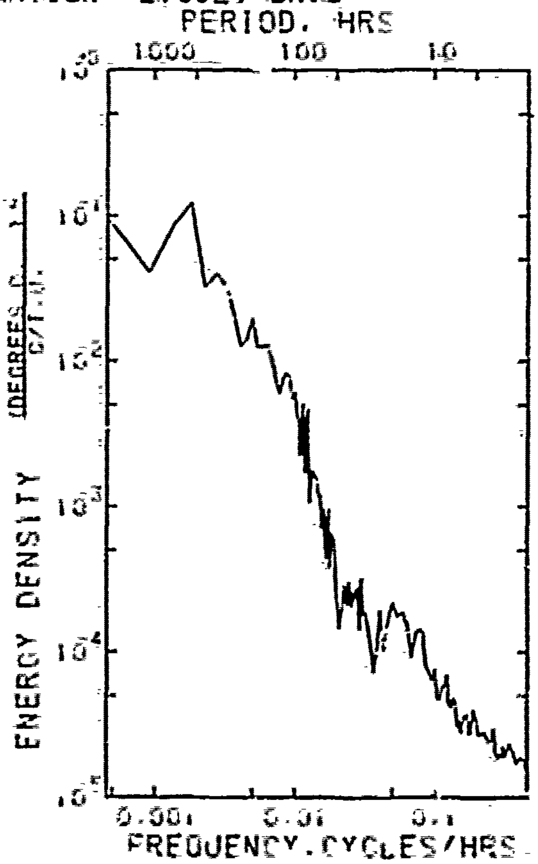
VARIABLE	*	EAST COMP	NORTH COMP	SPEED	TEMPERATURE
UNITS	*	MM/SEC	MM/SEC	MM/SEC	DEGREES C.
MEAN	=	7.735	-7.238	65.971	2.243
STD. ERR.	=	.587	.754	.510	.240E-3
VARIANCE	=	2237.577	3687.979	1685.579	.375E-3
STD. DEV.	=	47.303	60.729	41.056	.194E-1
KURTOSIS	=	2.719	3.232	3.096	28.237
SKEWNESS	=	.391	.426E-1	.772	3.521
MINIMUM	=	-110.716	-245.405	16.844	2.201
MAXIMUM	=	178.061	189.532	247.259	2.426

EAST CCMP & NORTH COMP

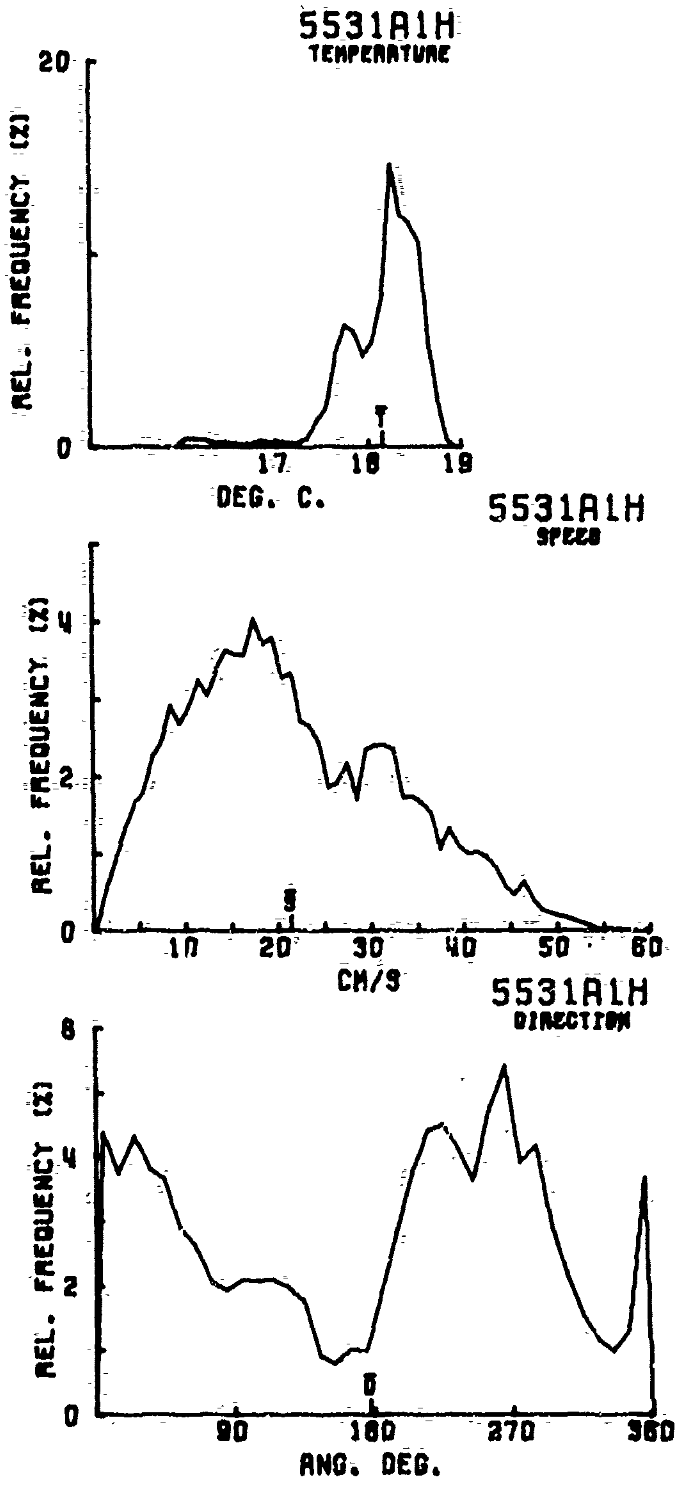
COVARIANCE	=	-1639.681
STD. ERR. OF COVARIANCE	=	38.826
STD. DEV. OF COVARIANCE	=	3127.367
CORRELATION COEFFICIENT	=	-.571
VECTOR MEAN	=	10.593
VECTOR VARIANCE	=	2962.778
VECTOR STD. DEV.	=	54.431

```
* SAMPLE SIZE =  6488 POINTS
*
* SPANNING RANGE
* FROM   75- IV -30   10.30.42
* TO     76-  I -25   17.30.42
*
* DURATION   270.29 DAYS
```

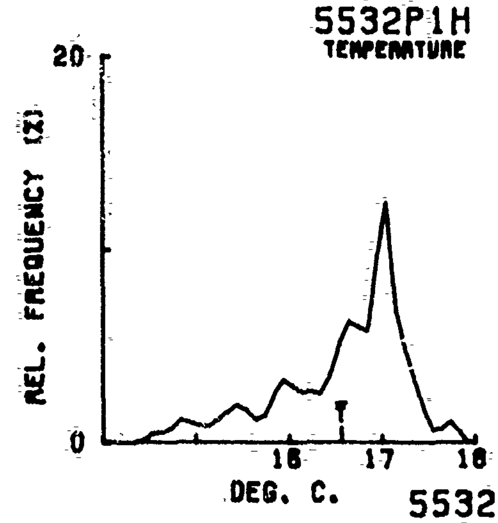


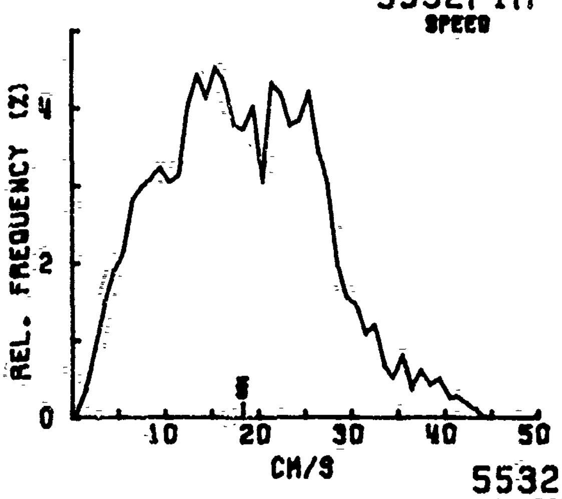


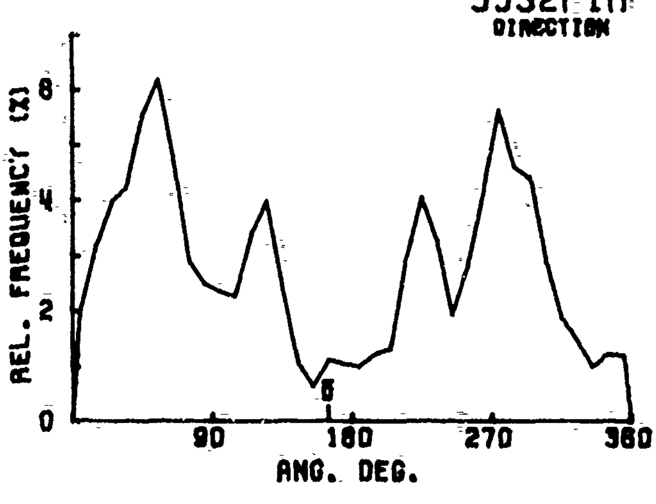
AUTO SPECTRUM
5557B1H TEMPERATURE
40.6 METERS
75-IV-30 TO 76-I-25
PIECES WITH 3240 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

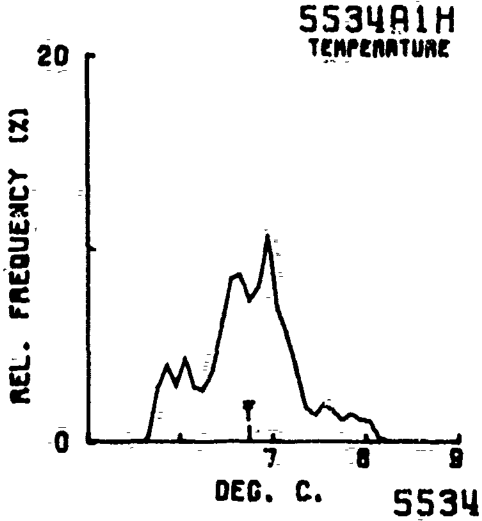


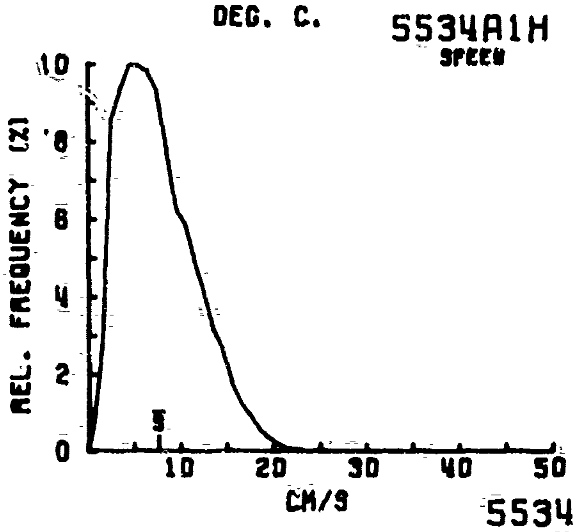
5531A1H
TEMPERATURE
20
0
REL. FREQUENCY (%)
T
17
18
19
DEG. C.
5531A1H
SPEED
4
2
0
REL. FREQUENCY (%)
S
10
20
30
40
50
60
CM/S
5531A1H
DIRECTION
6
4
2
0
REL. FREQUENCY (%)
D
90
180
270
360
ANG. DEG.

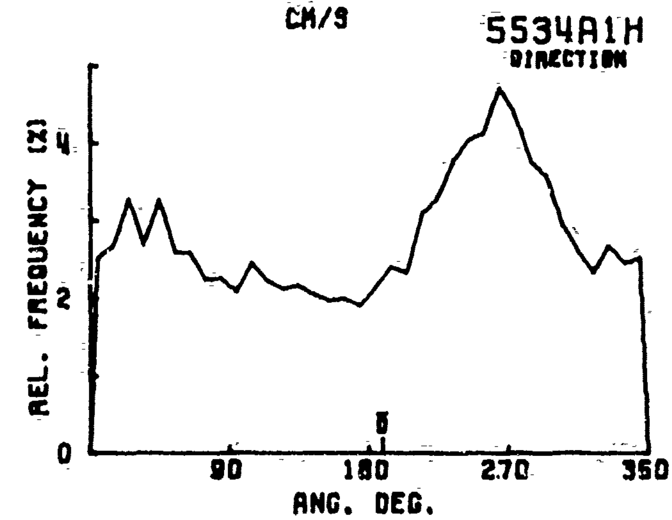

5532P1H
TEMPERATURE
REL. FREQUENCY (%)
20
0
16
17
18
T
DEG. C.

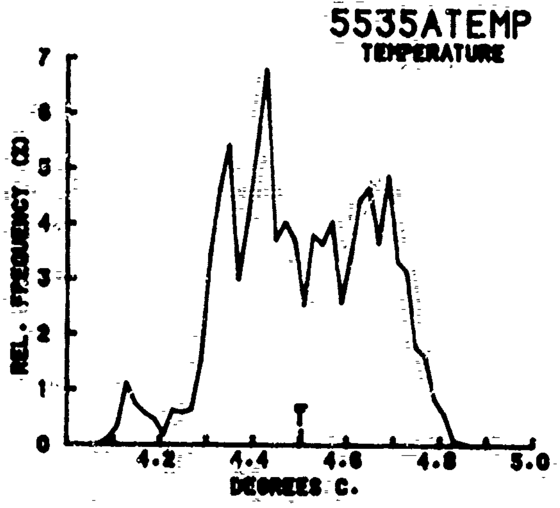

5532P1H
SPEED
REL. FREQUENCY (%)
4
2
0
10
20
30
40
50
S
CM/S

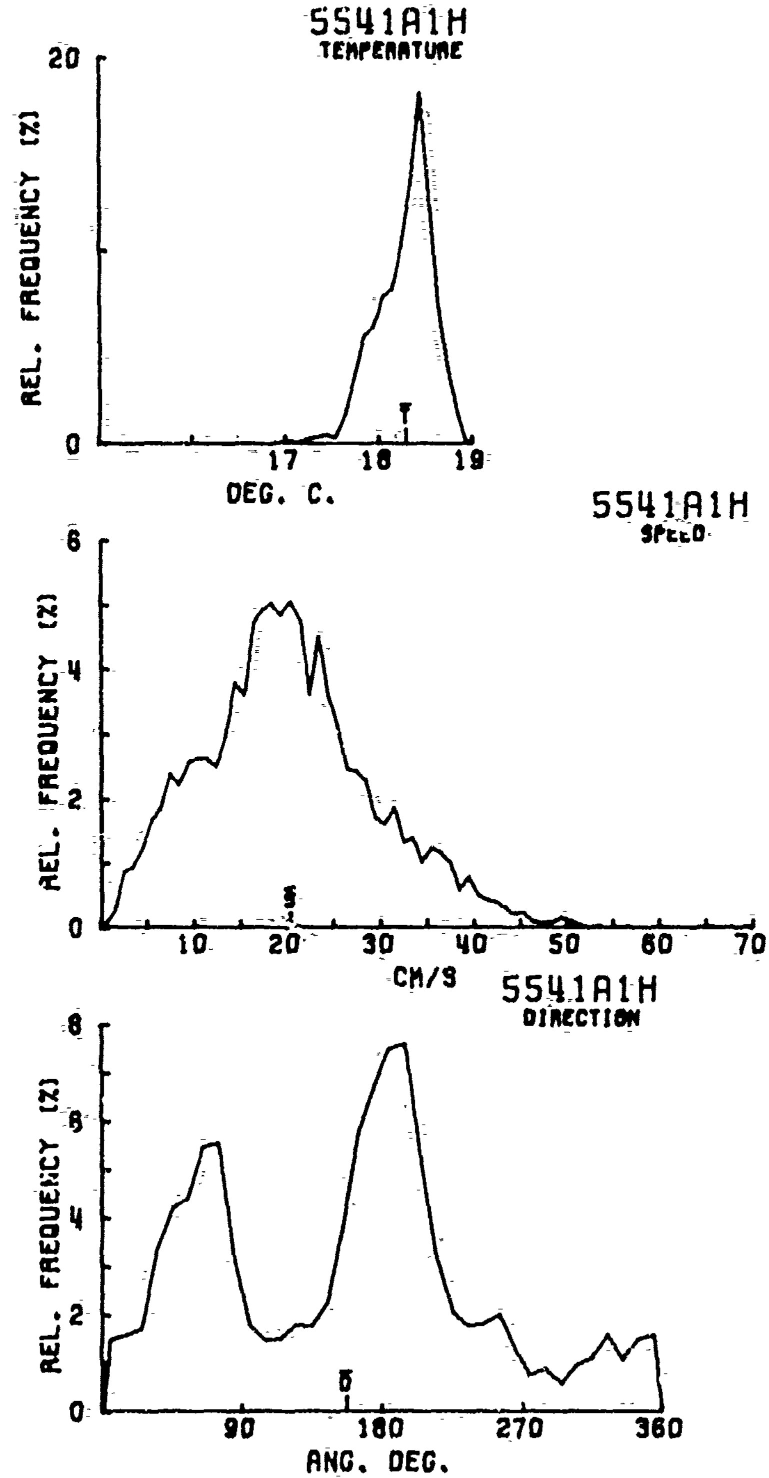

5532P1H
DIRECTION
REL. FREQUENCY (%)
6
4
2
0
90
180
270
360
D
ANG. DEG.

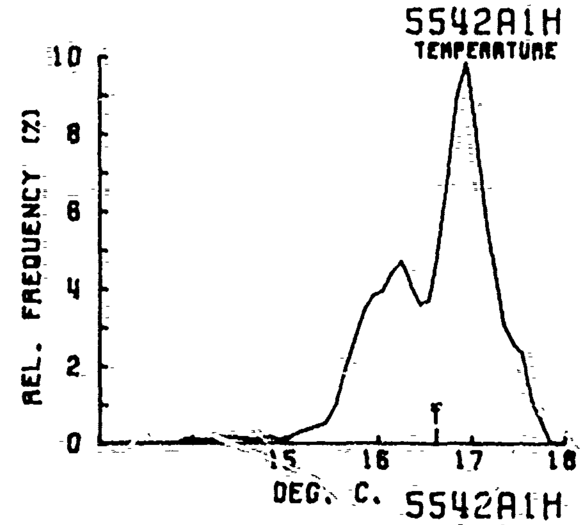

5534A1H
TEMPERATURE
REL. FREQUENCY (%)
20
0
7
8
9
DEG. C.

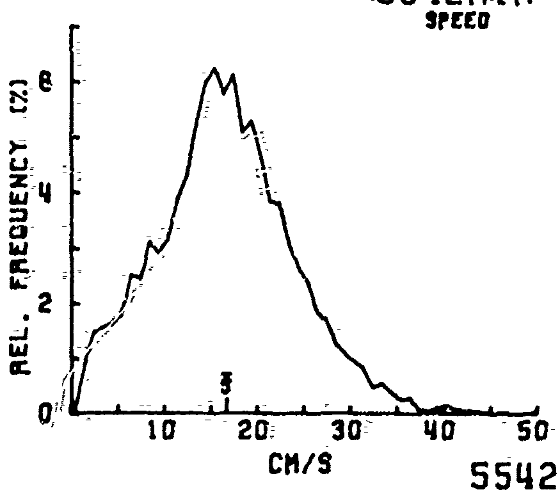

5534A1H
SPEED
REL. FREQUENCY (%)
10
8
6
4
2
0
10
20
30
40
50
CM/S

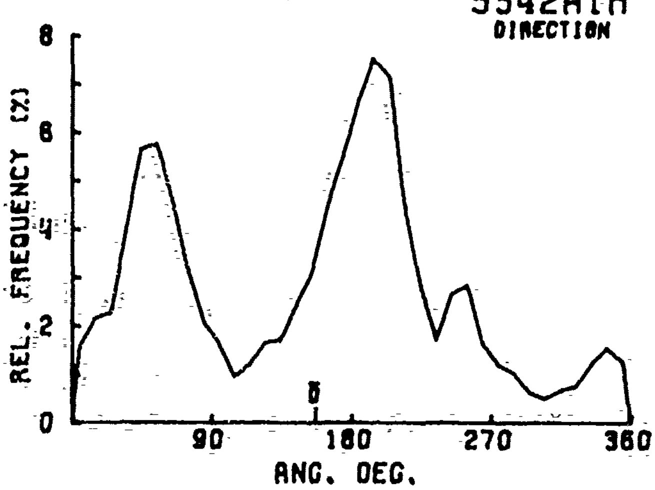

5534A1H
DIRECTION
REL. FREQUENCY (%)
4
2
0
90
180
270
360
ANG. DEG.

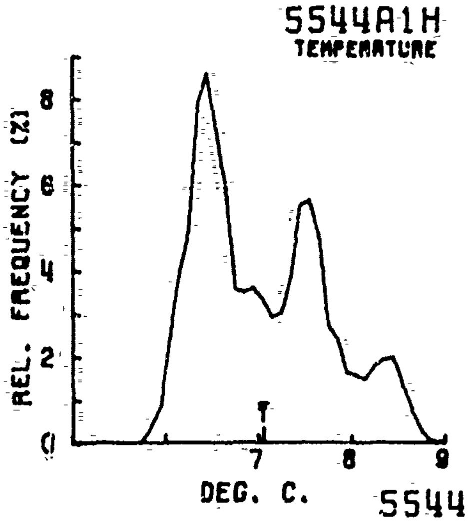

5535ATEMP
TEMPERATURE
REL. FREQUENCY (%)
DEGREES C.
0
1
2
3
4
5
6
7
4.2
4.4
4.6
4.8
5.0

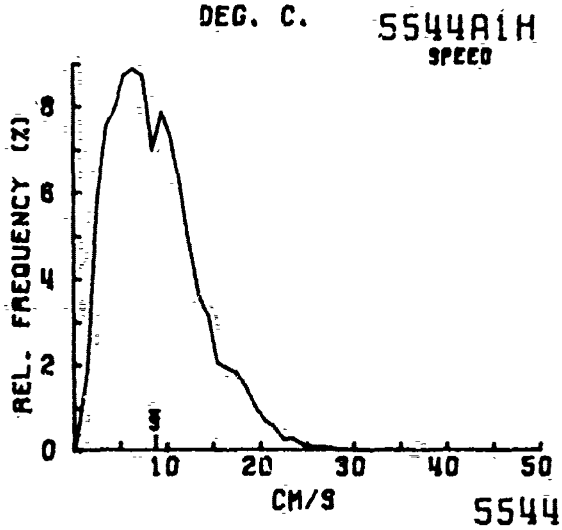

5541A1H
TEMPERATURE
REL. FREQUENCY (%)
20
0
17
18
19
DEG. C.
5541A1H
SPEED
REL. FREQUENCY (%)
6
4
2
0
10
20
30
40
50
60
70
CM/S
5541A1H
DIRECTION
REL. FREQUENCY (%)
8
6
4
2
0
90
180
270
360
ANG. DEG.

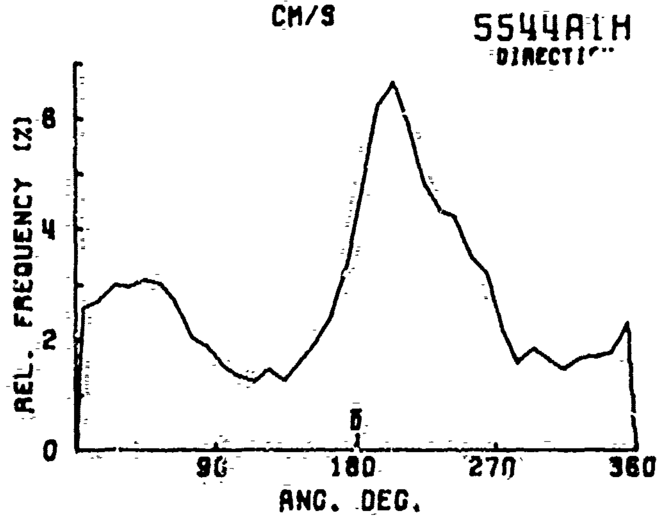

5542A1H
TEMPERATURE
REL. FREQUENCY (%)
0
2
4
6
8
10
15
16
17
18
DEG. C.

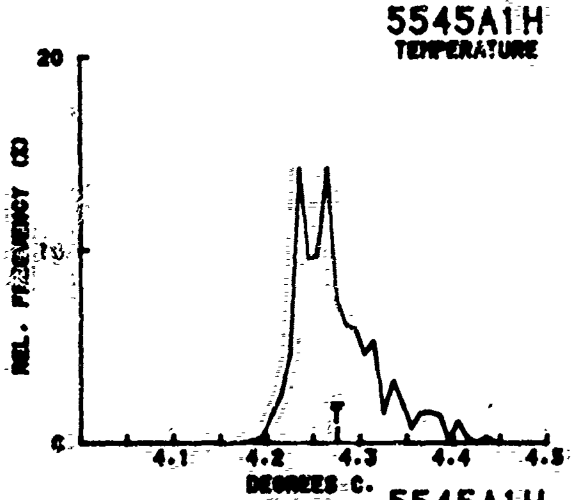

5542A1H
SPEED
REL. FREQUENCY (%)
0
2
4
6
10
20
30
40
50
CM/S

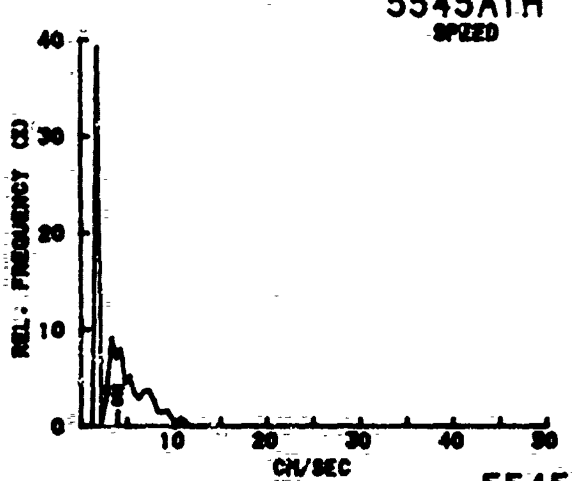

5542A1H
DIRECTION
REL. FREQUENCY (%)
0
2
4
6
8
90
180
270
360
ANG. DEG.

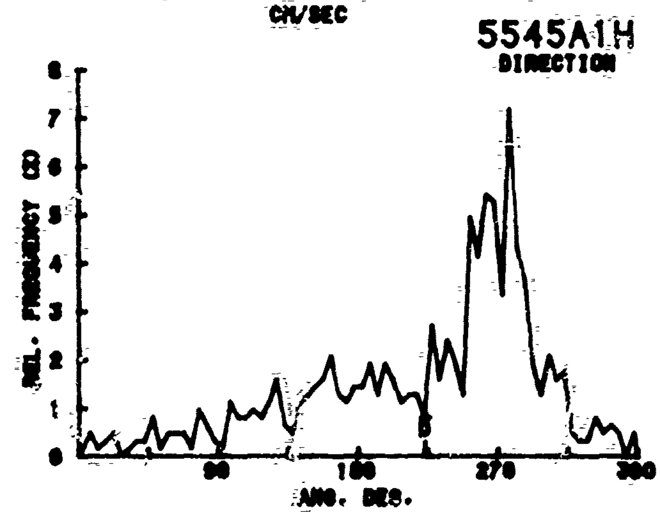

5544A1H
TEMPERATURE
REL. FREQUENCY (%)
DEG. C.

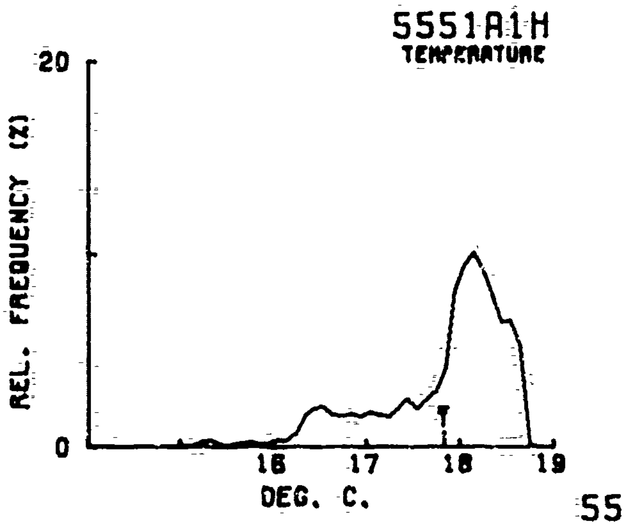

5544A1H
SPEED
REL. FREQUENCY (%)
CM/S

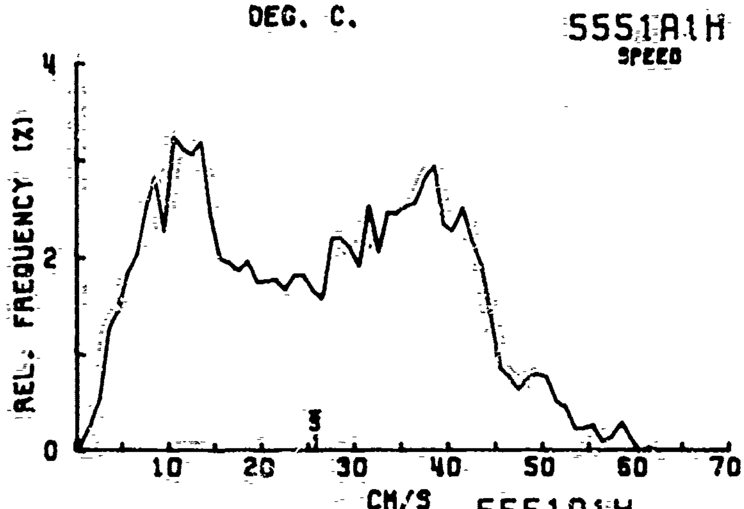

5544A1H
REL. FREQUENCY (%)
ANG. DEG.

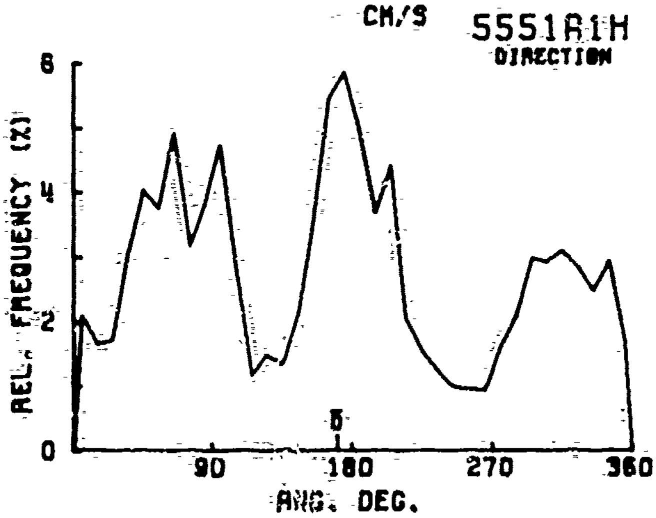

5545A1H
TEMPERATURE
REL. FREQUENCY (%)
20
10
0
4.1
4.2
4.3
4.4
4.5
DEGREES C.

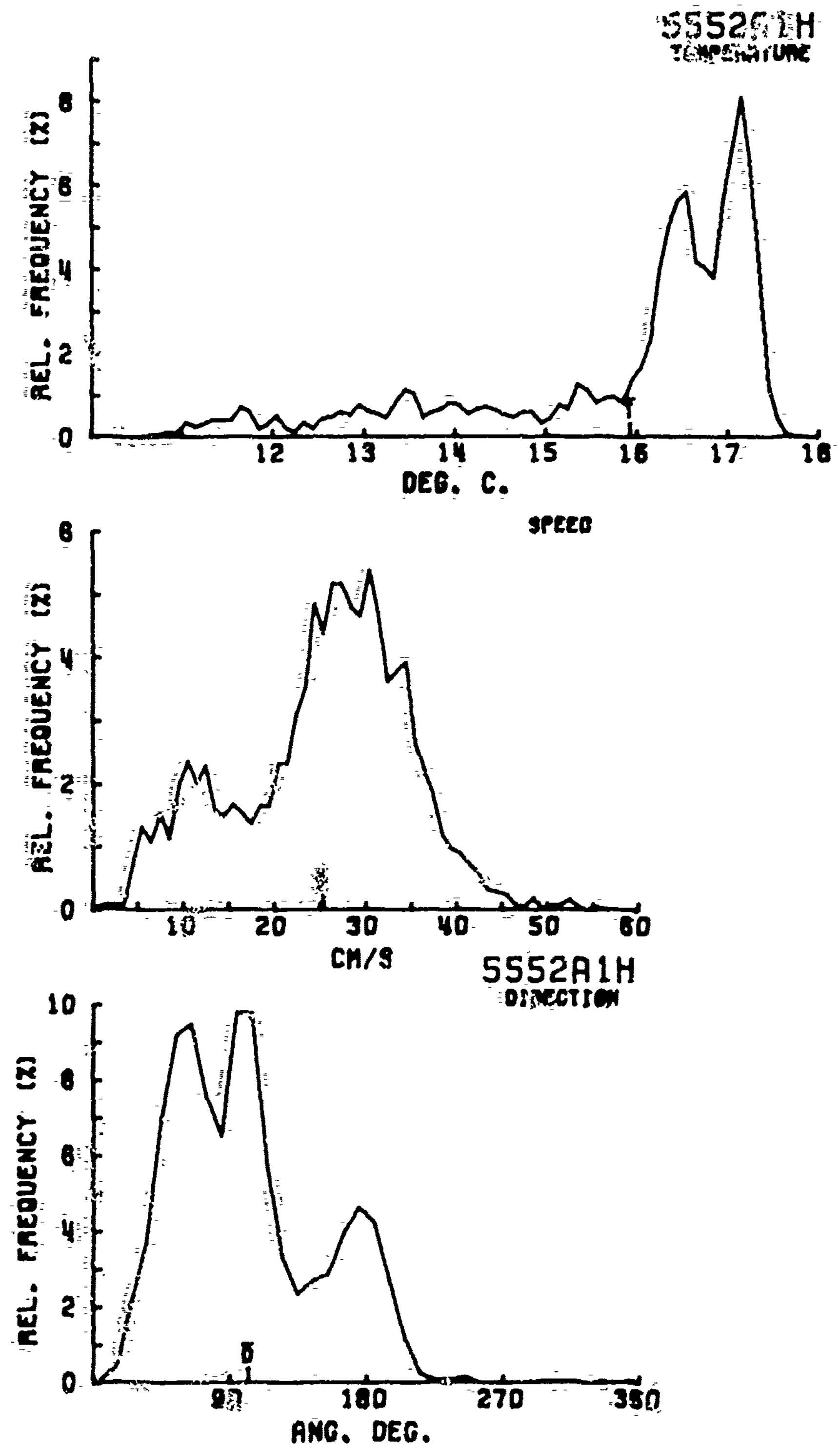

5545A1H
SPEED
REL. FREQUENCY (%)
40
30
20
10
0
10
20
30
40
50
CM/SEC

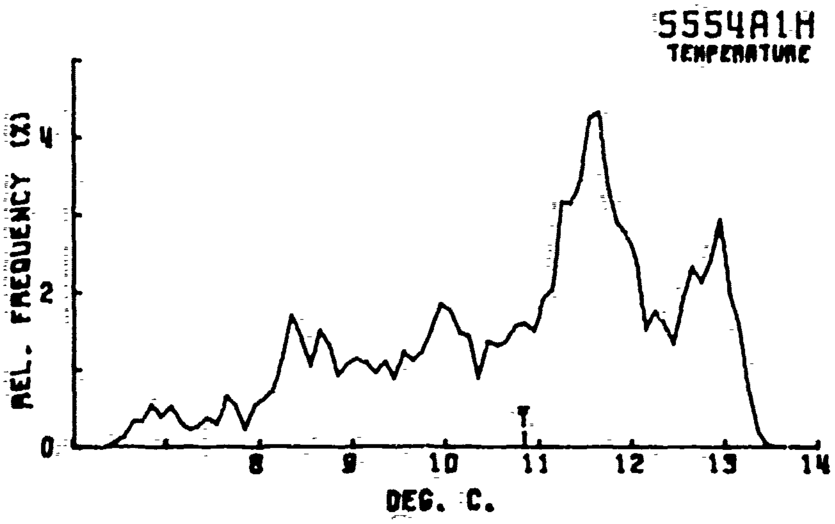

5545A1H
DIRECTION
REL. FREQUENCY (%)
8
7
6
5
4
3
2
1
0
90
180
270
360
ANG. DEG.

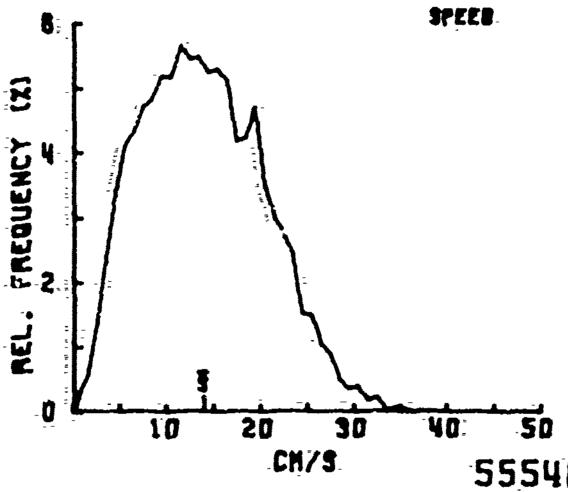

5551A1H
TEMPERATURE
REL. FREQUENCY (%)
20
0
16
17
18
19
DEG. C.

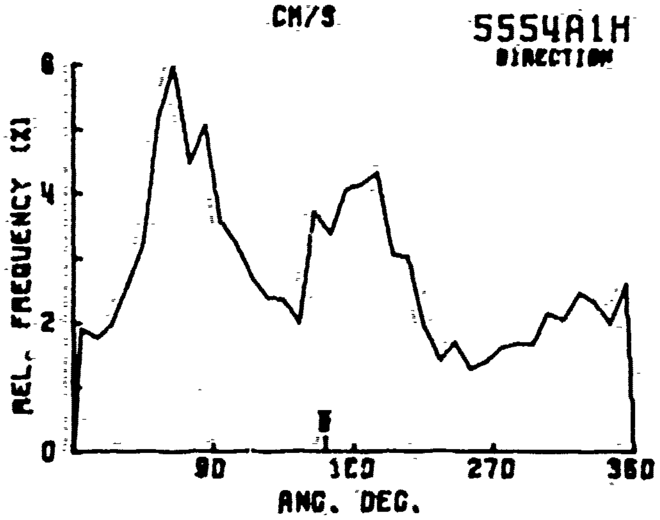

5551A1H
SPEED
REL. FREQUENCY (%)
4
2
0
10
20
30
40
50
60
70
CM/S

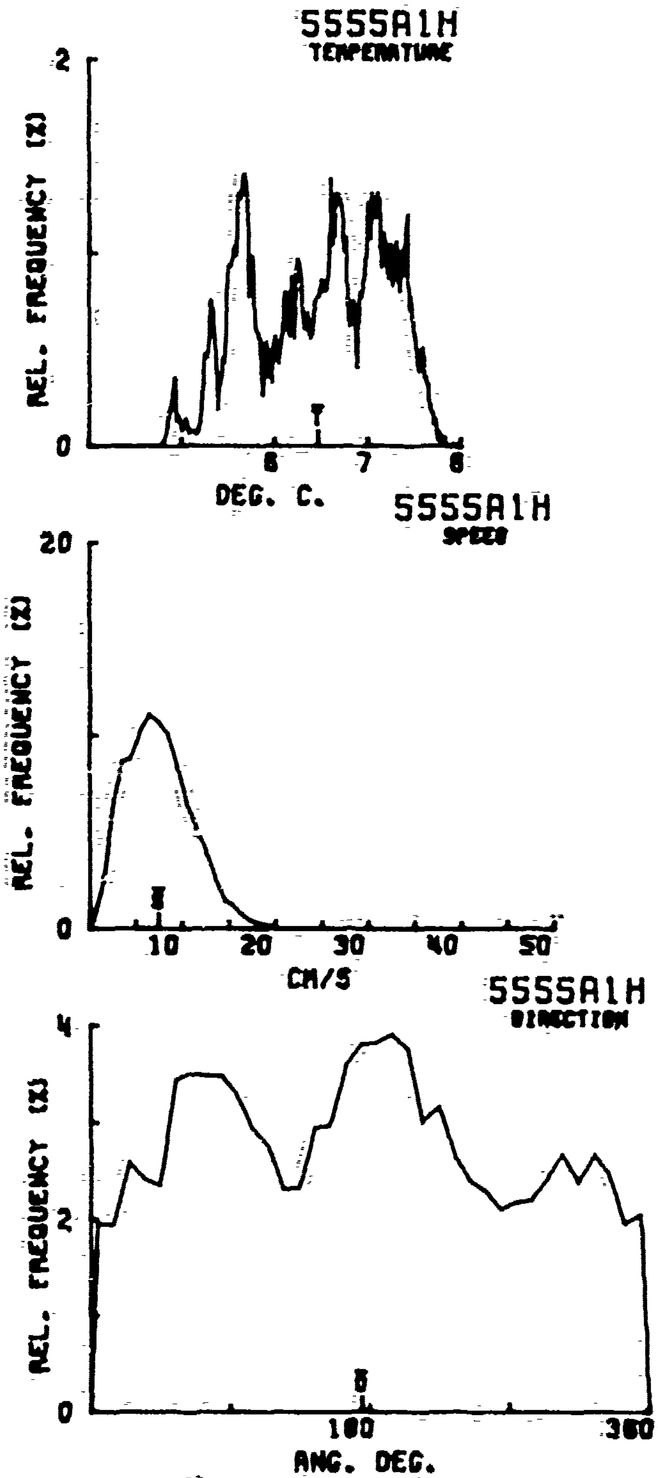

5551A1H
DIRECTION
REL. FREQUENCY (%)
6
4
2
0
90
180
270
360
ANG. DEG.

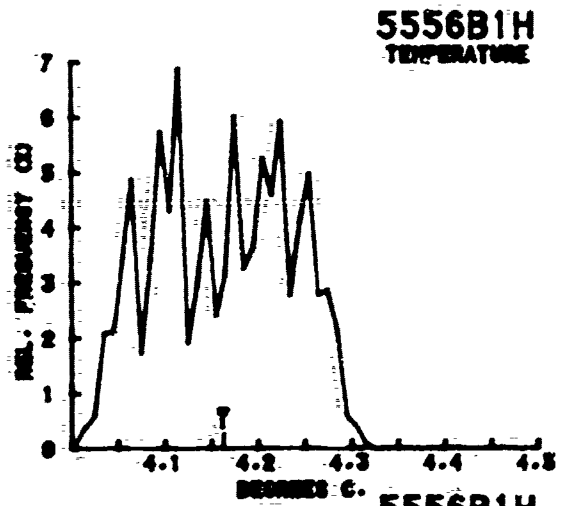

5552A1H
TEMPERATURE
REL. FREQUENCY (%)
0
2
4
6
8
12
13
14
15
16
17
18
DEG. C.
SPEED
REL. FREQUENCY (%)
0
2
4
6
10
20
30
40
50
60
CM/S
5552A1H
DIRECTION
REL. FREQUENCY (%)
0
2
4
6
8
10
90
180
270
360
ANG. DEG.

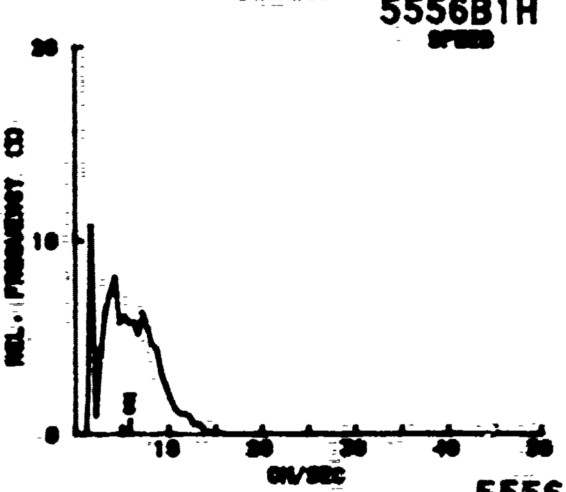

5554A1H
TEMPERATURE
REL. FREQUENCY (%)
0
2
4
8
9
10
11
12
13
14
T
DEG. C.

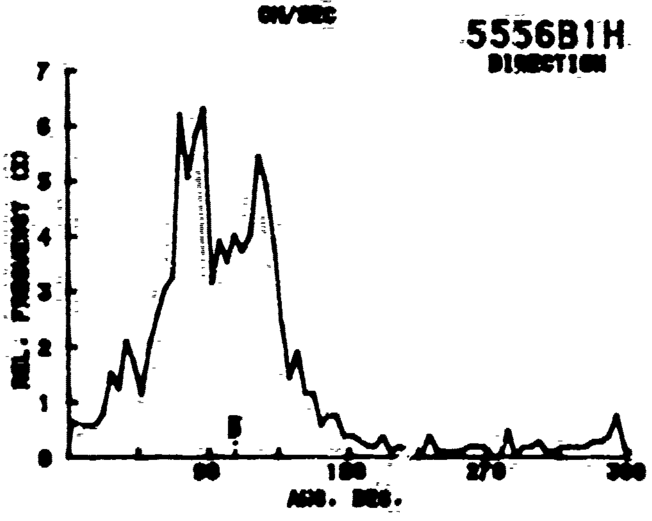

SPEED
REL. FREQUENCY (%)
0
2
4
6
10
20
30
40
50
CM/S


5554A1H
DIRECTION
REL. FREQUENCY (%)
0
2
4
6
90
180
270
360
ANG. DEG.

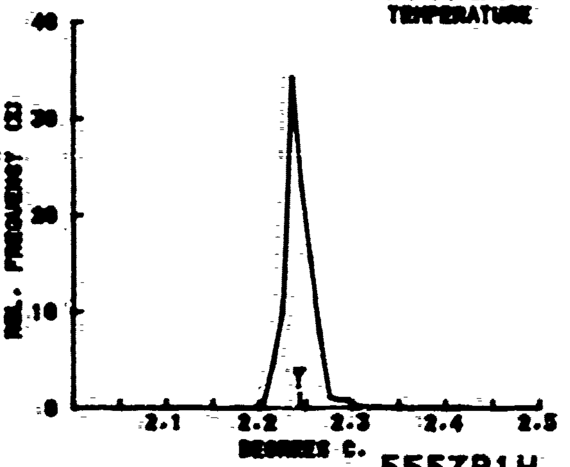

5555A1H
TEMPERATURE
REL. FREQUENCY (%)
2
0
6
7
8
DEG. C.
5555A1H
SPEED
REL. FREQUENCY (%)
20
0
10
20
30
40
50
CM/S
5555A1H
DIRECTION
REL. FREQUENCY (%)
4
2
0
180
360
ANG. DEG.


5556B1H
TEMPERATURE
REL. FREQUENCY (%)
DEGREES C.
4.1
4.2
4.3
4.4
4.5


5556B1H
SPEED
REL. FREQUENCY (%)
CM/SEC
10
20
30
40
50


5556B1H
DIRECTION
REL. FREQUENCY (%)
ANG. DEG.
90
180
270
360

5557B1H
TEMPERATURE



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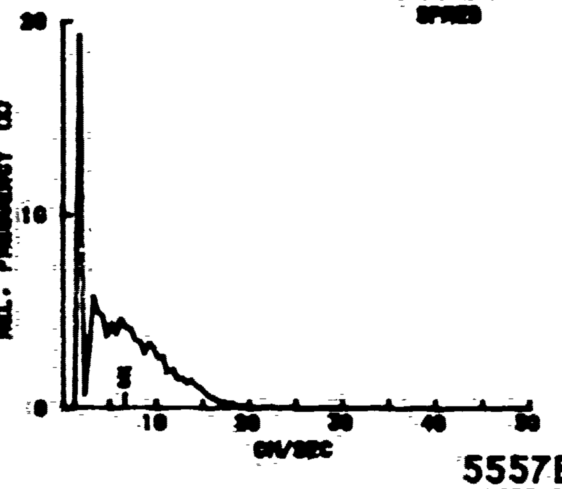
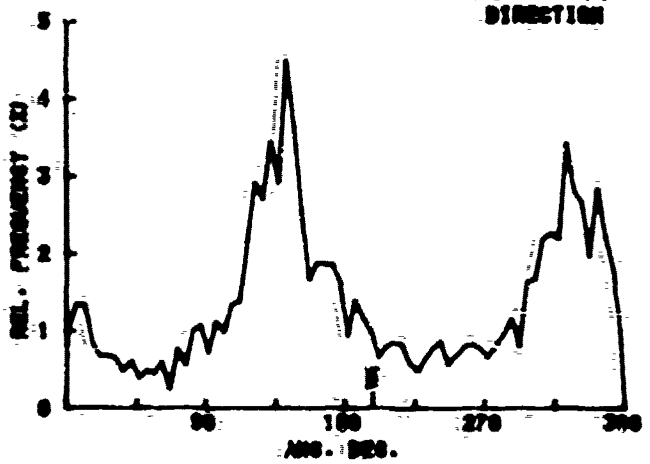
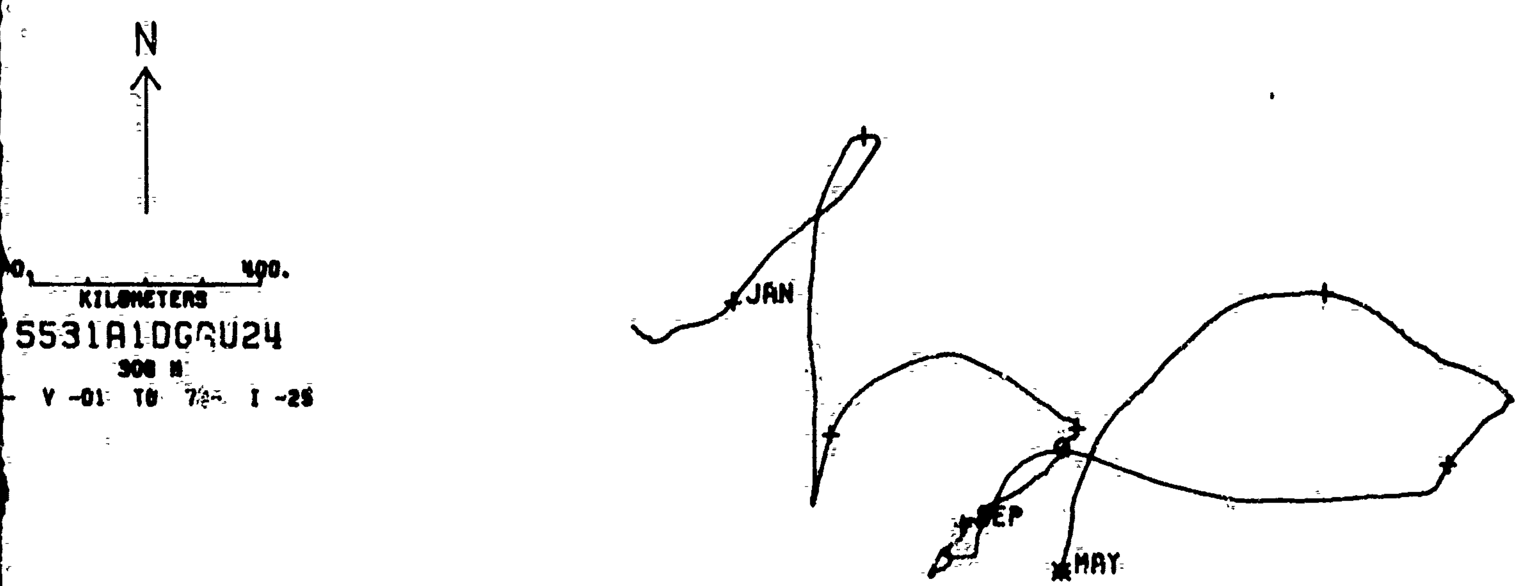
SPEED



5557B1H
DIRECTION

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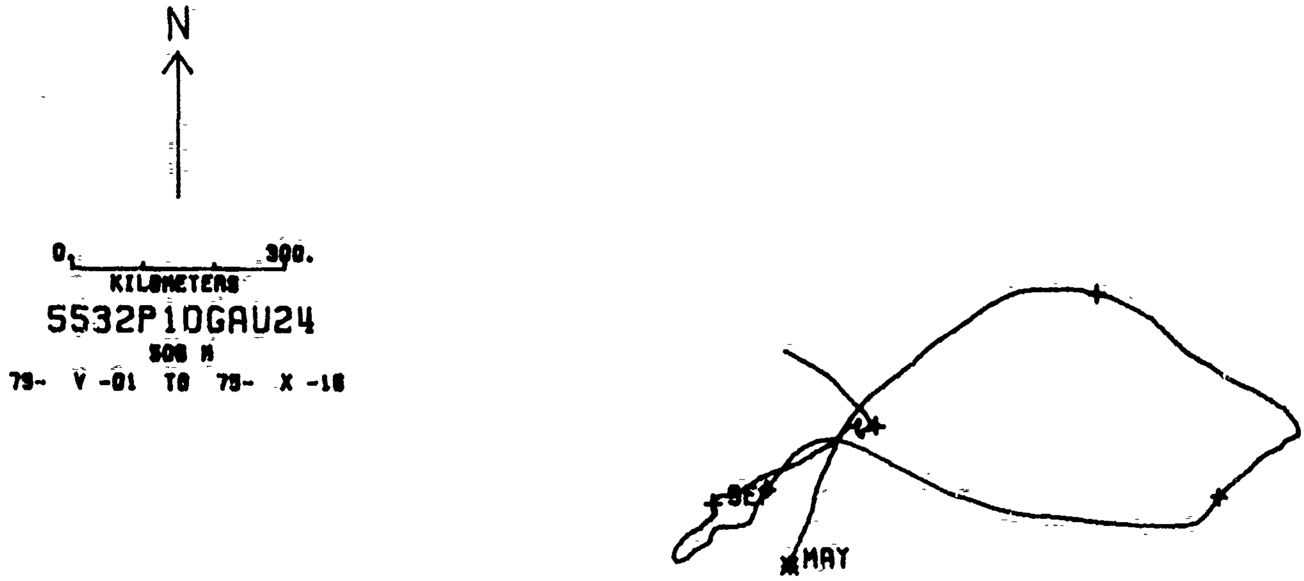
JAN
SEP
MAY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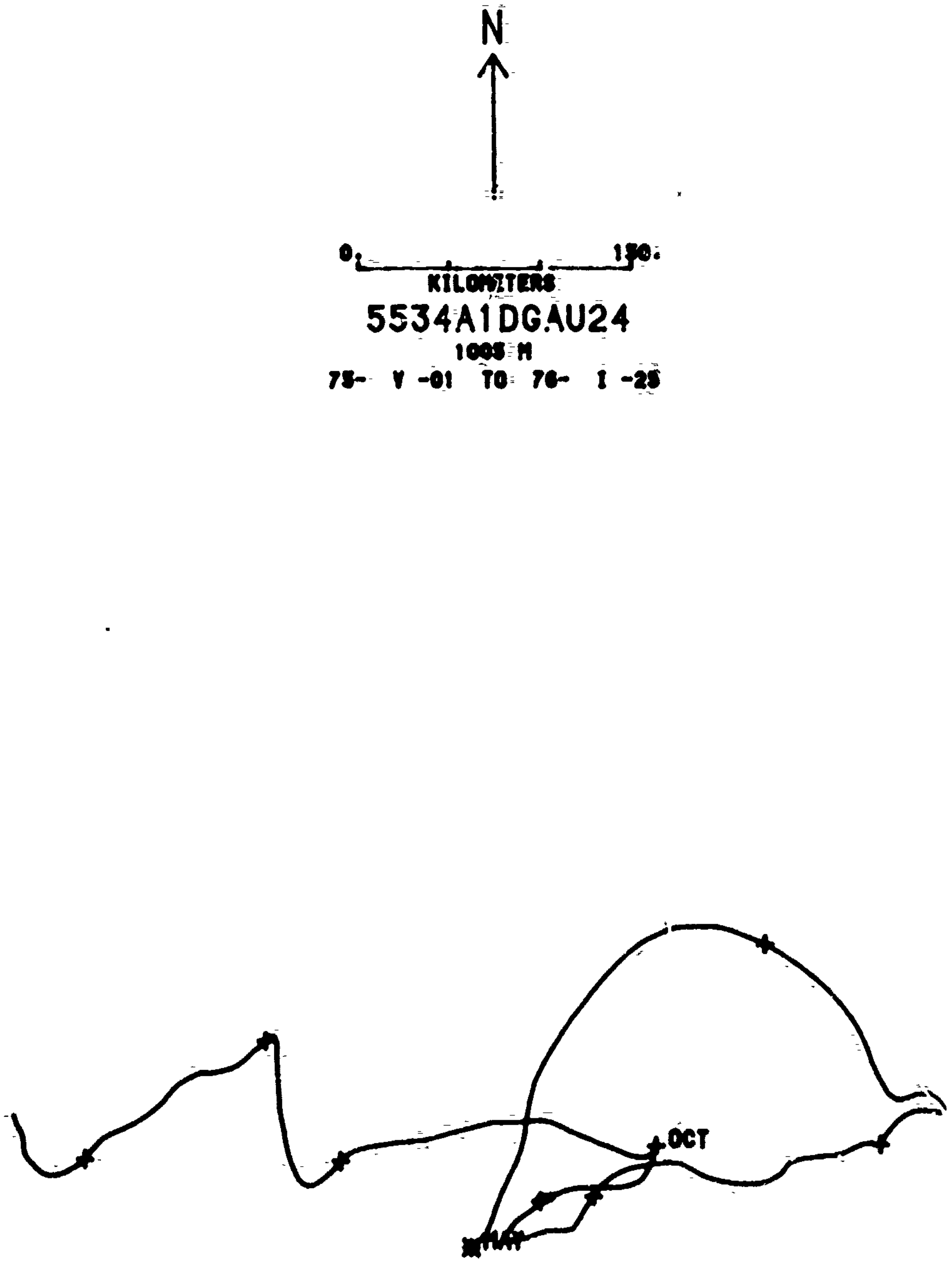
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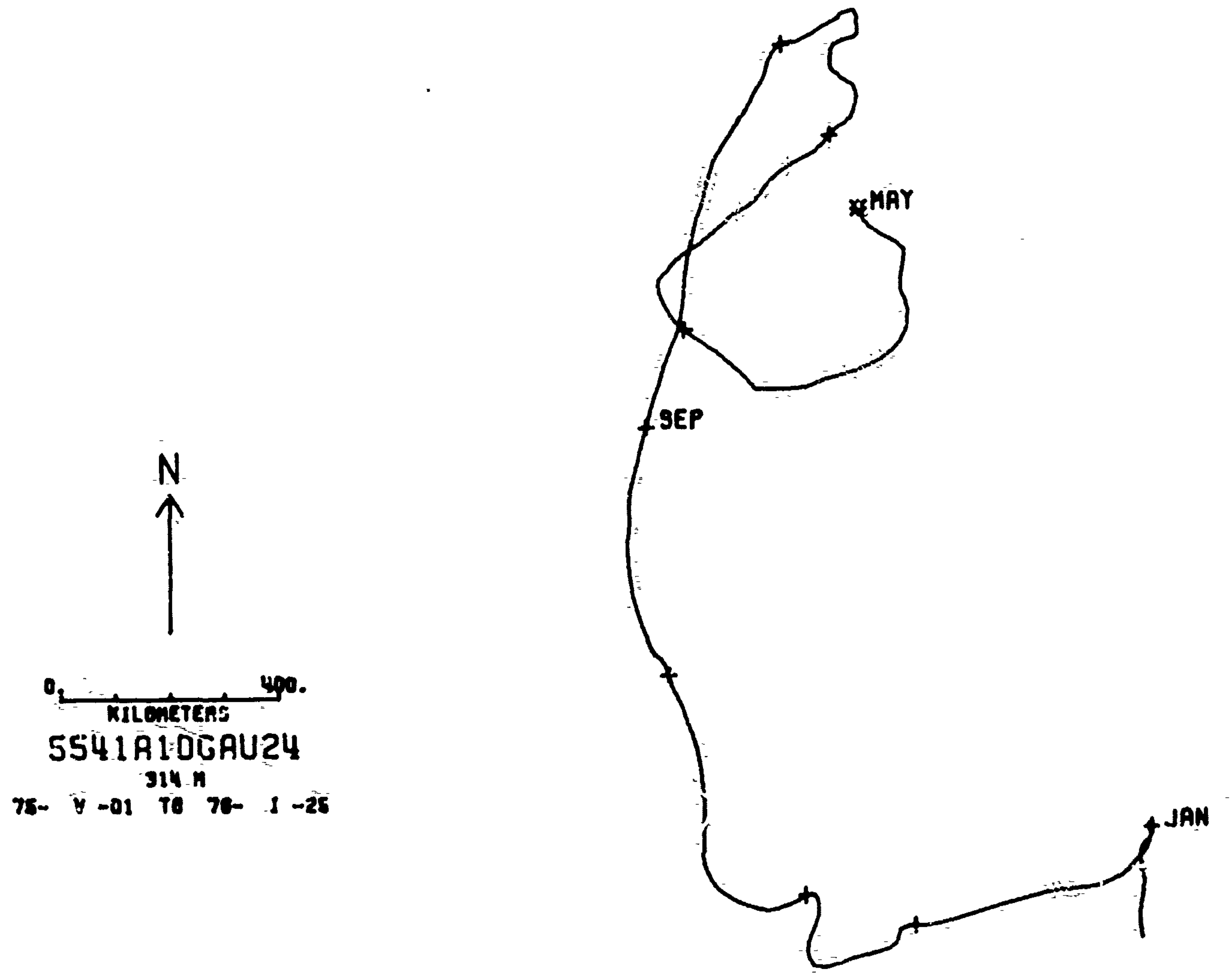
KILOMETERS
5534A1DGAU24
1005 M
75- V -01 TO 76- I -25
OCT
MAY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KILOMETERS
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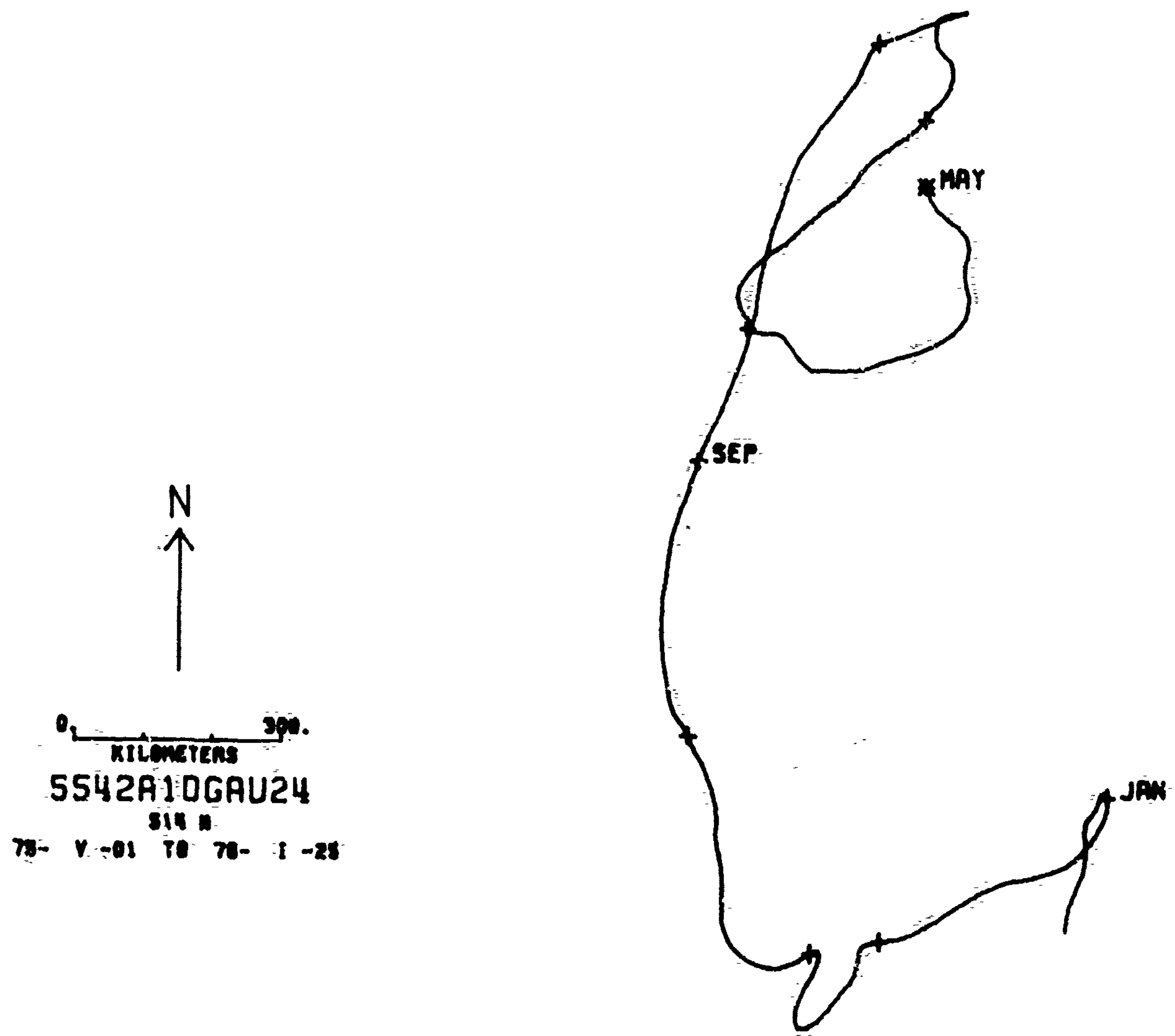
MAY
SEP
JAN



MAY
SEP
JAN
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KILOMETERS
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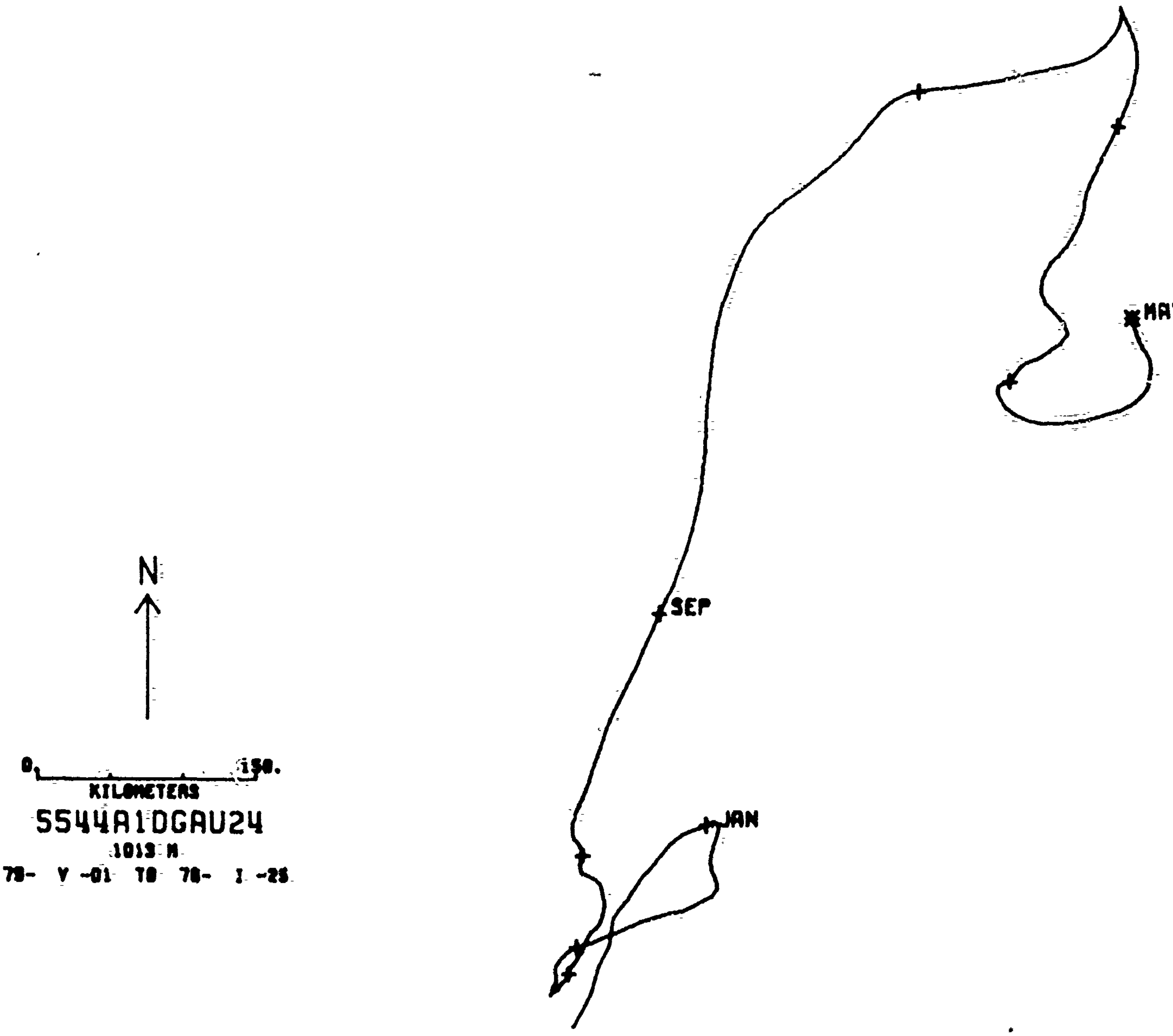
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MAY
SEP
JAN
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1013 M
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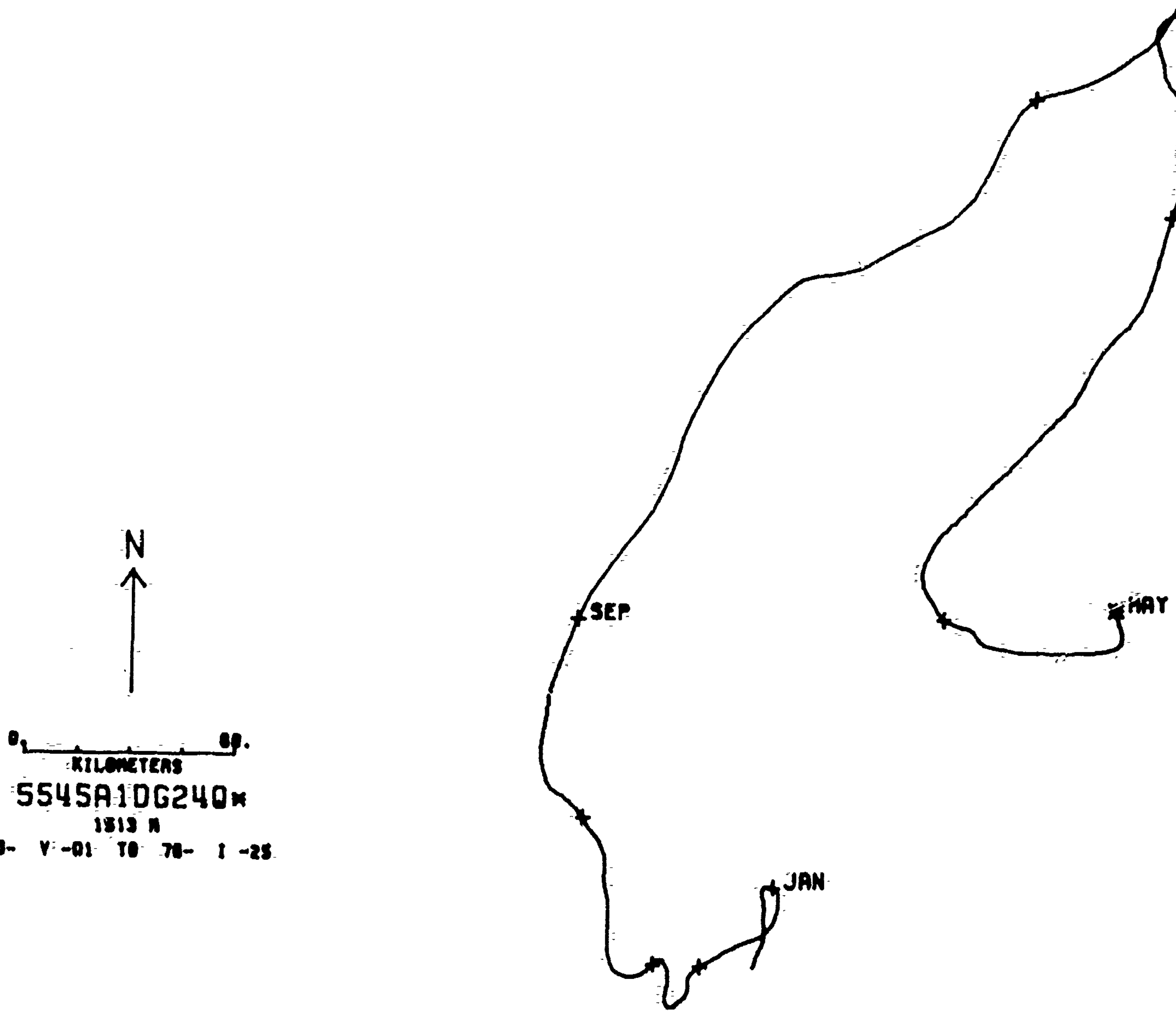
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SEP
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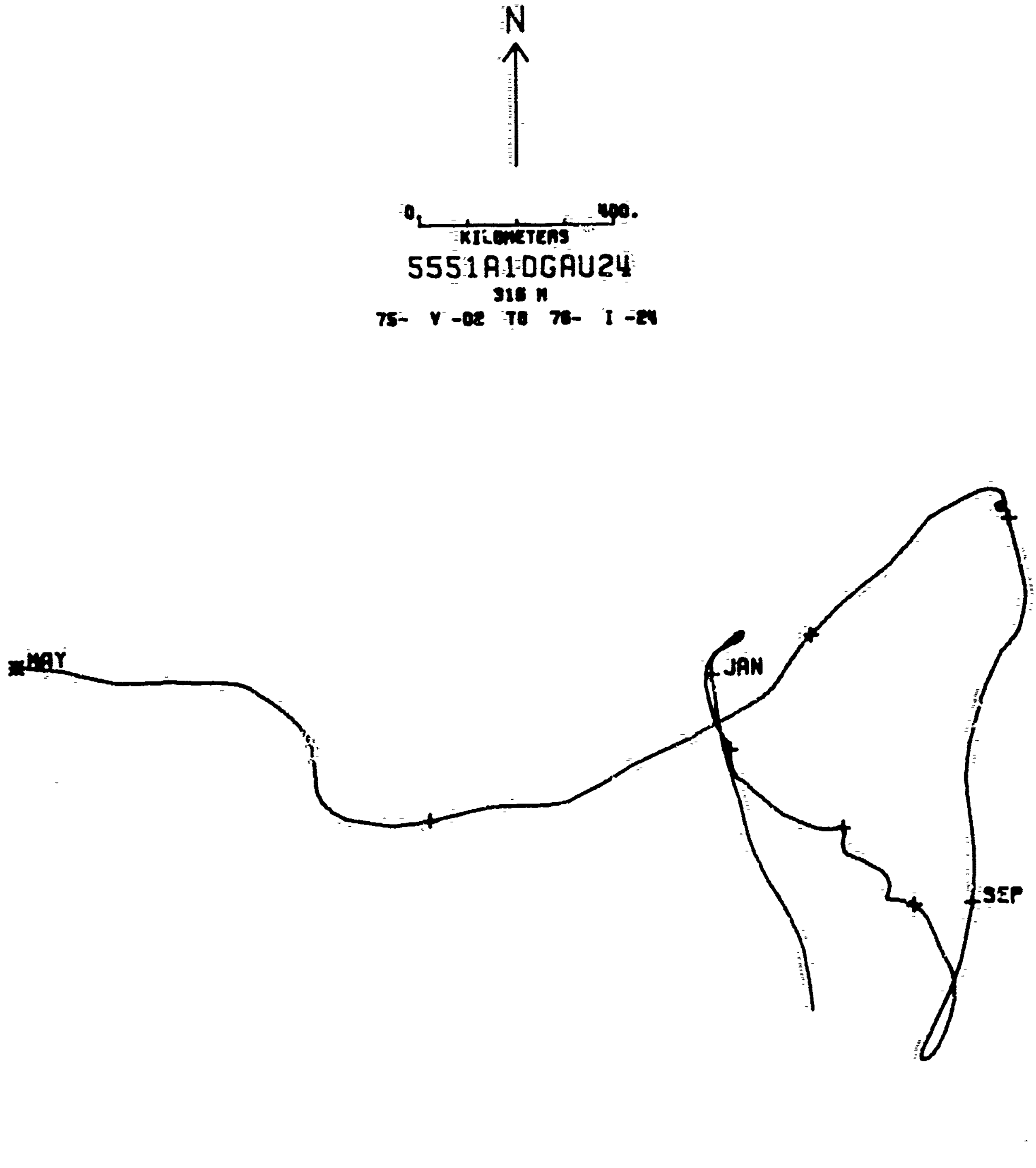

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KILOMETERS
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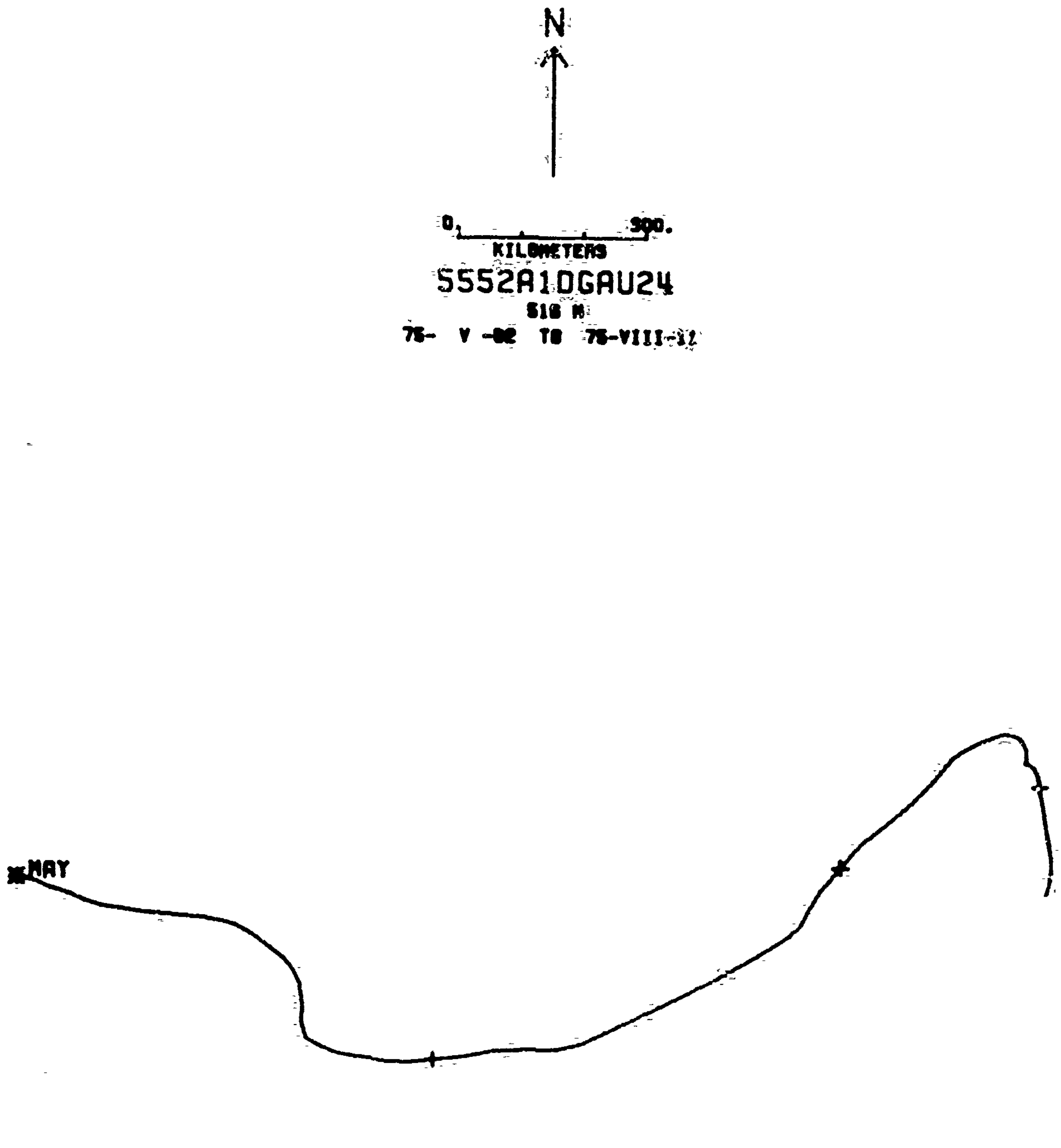
316 M
75- V -02 TO 76- I -24
MAY
JAN
SEP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518 M
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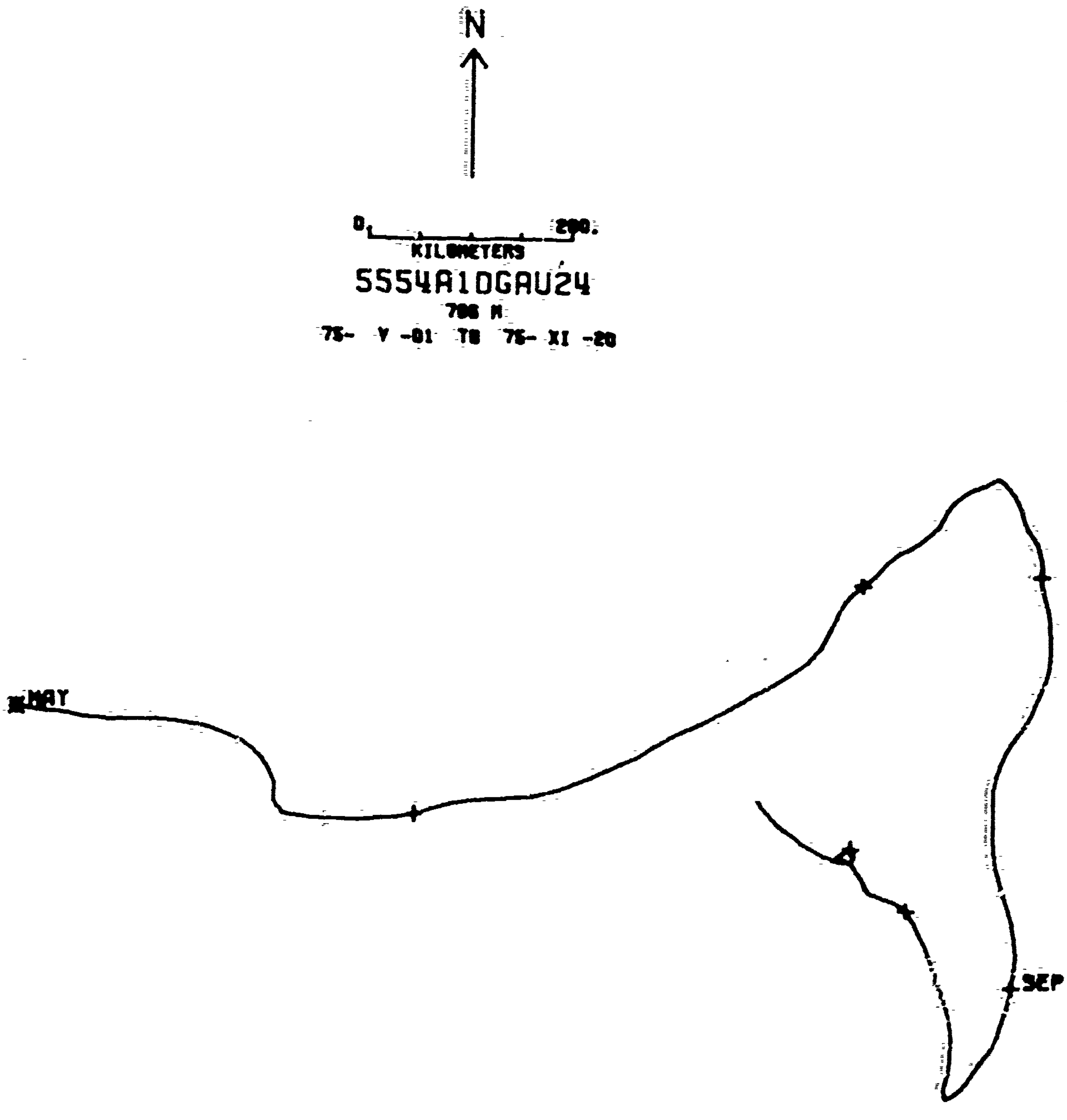
MAY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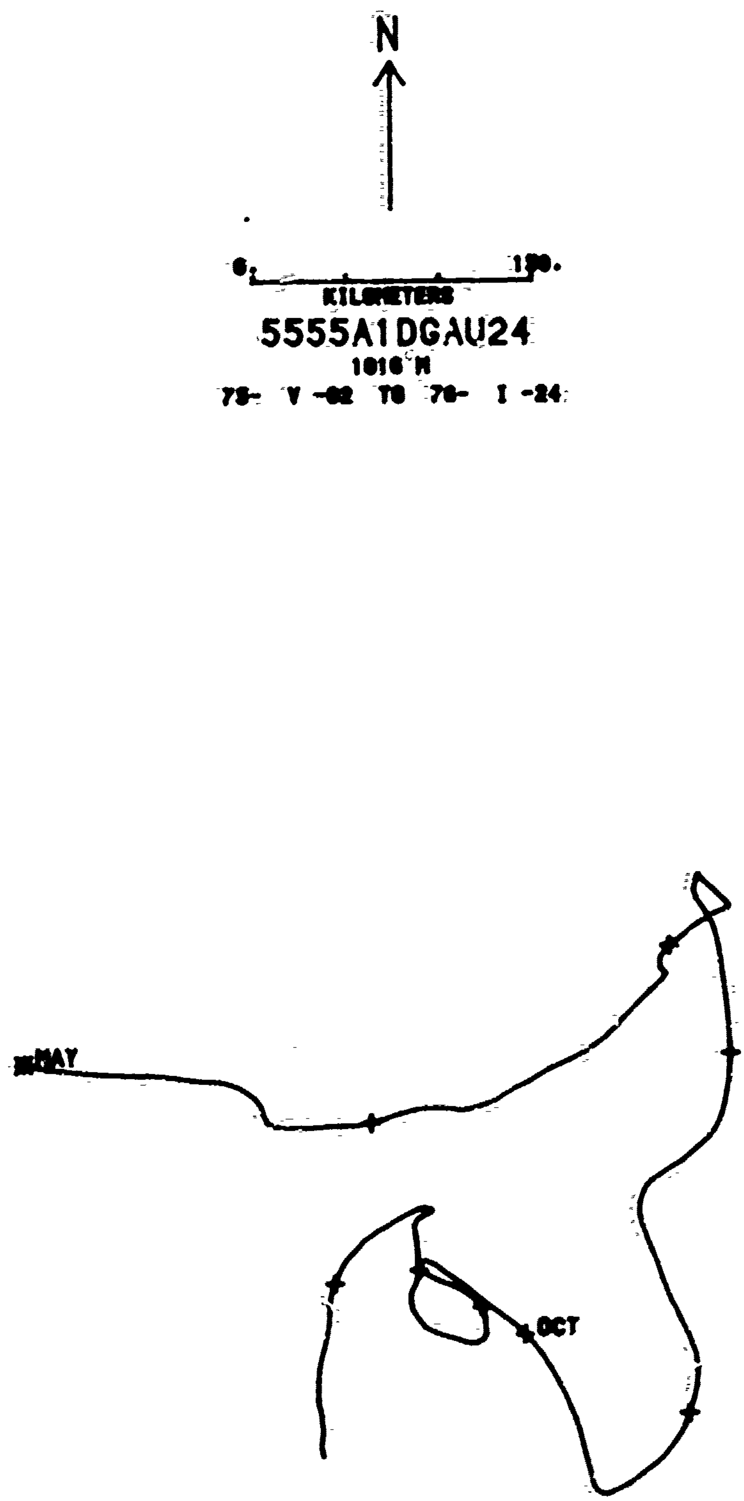
MAY
SEP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KILOMETERS
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1010 M
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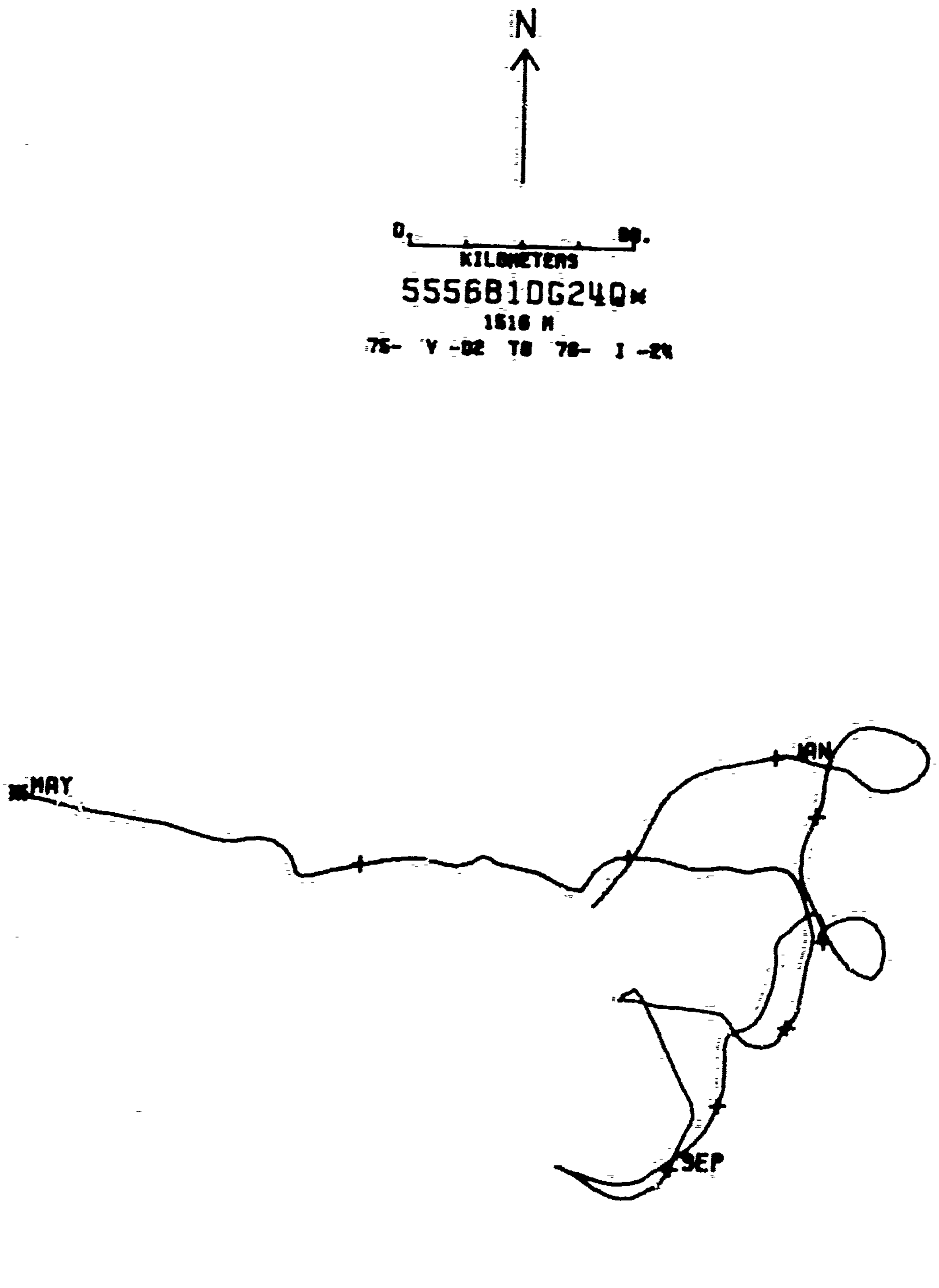
MAY
OCT



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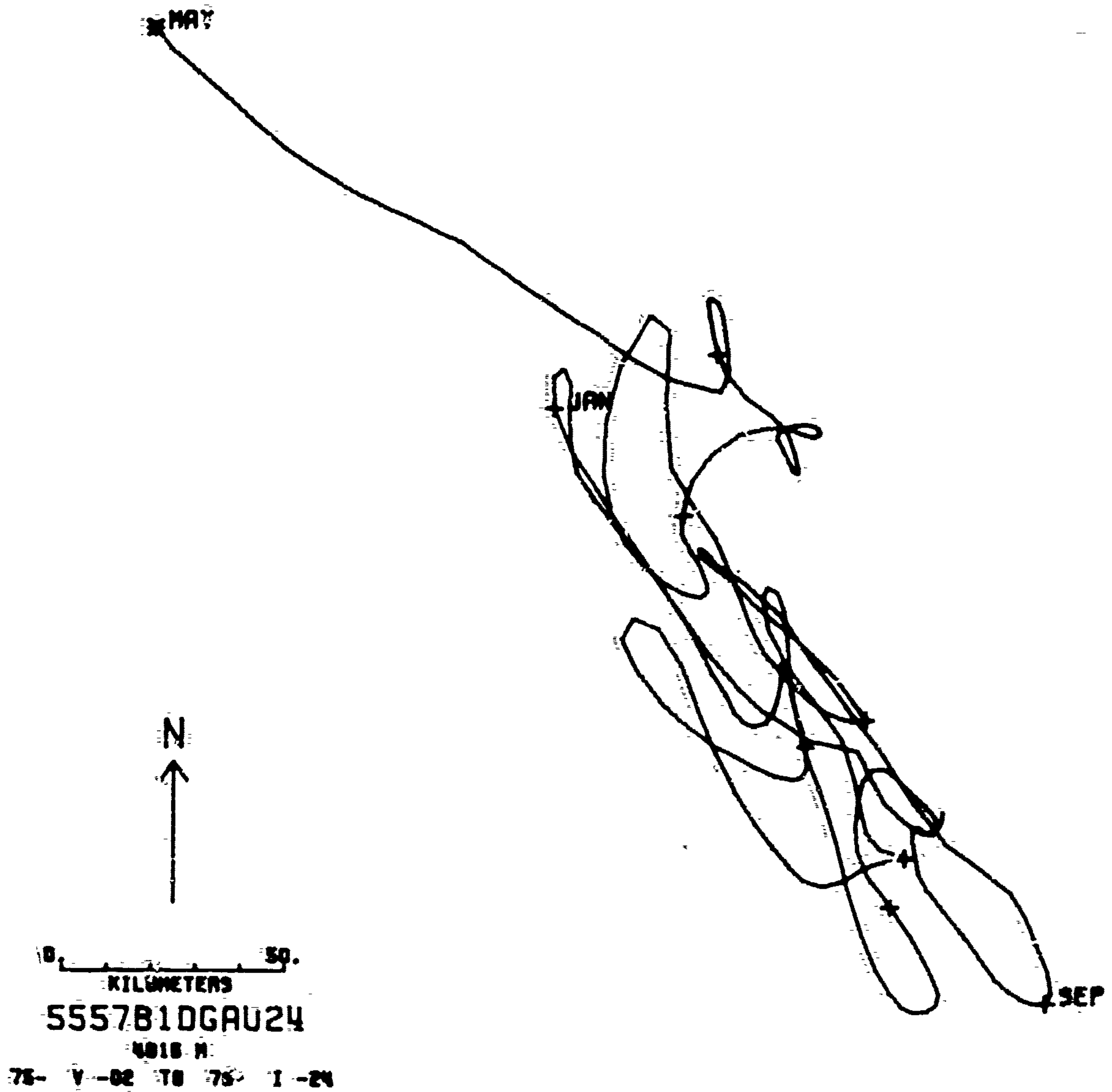
MAY
JAN
SEP
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0.
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KILOMETERS
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4016 M
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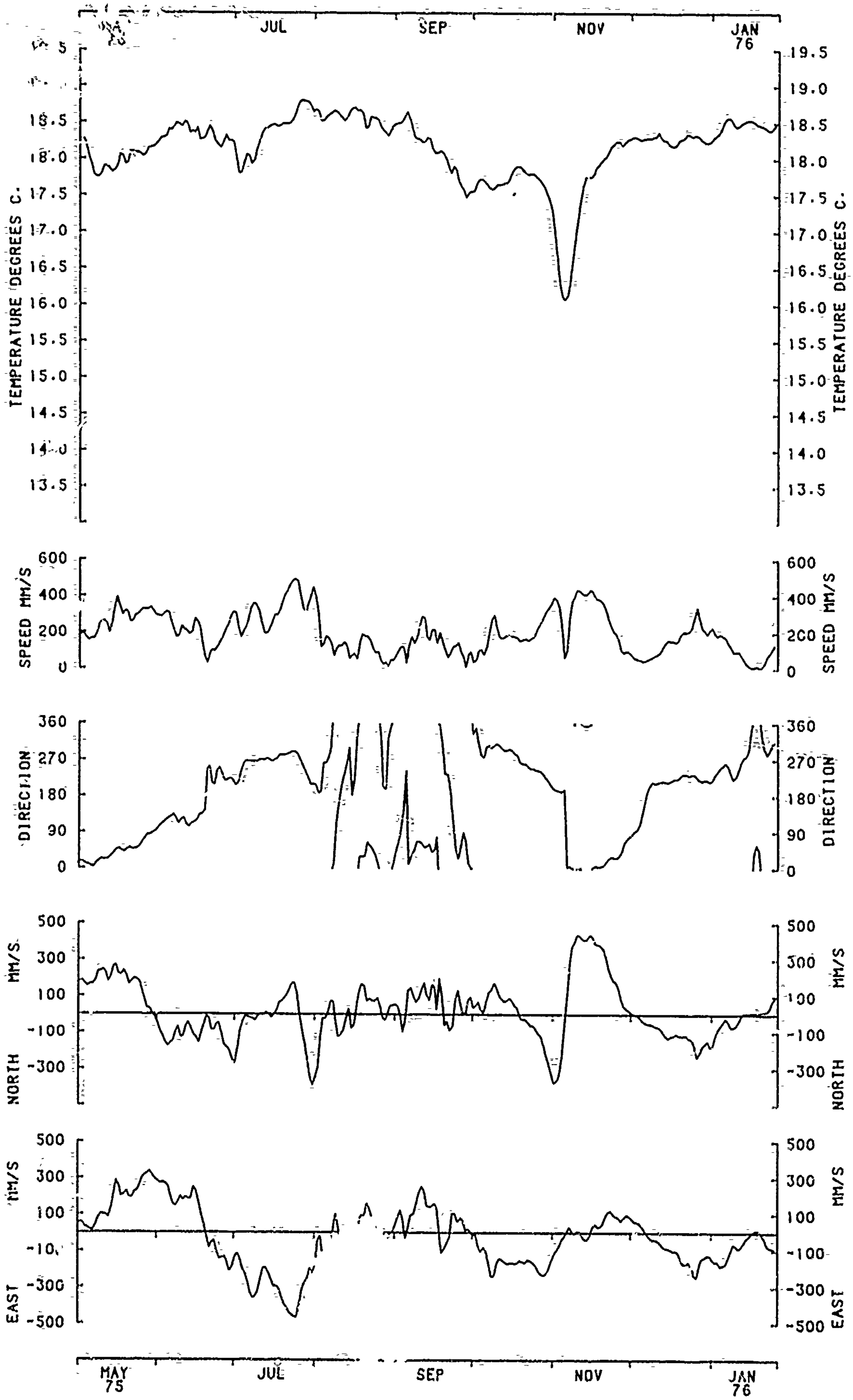
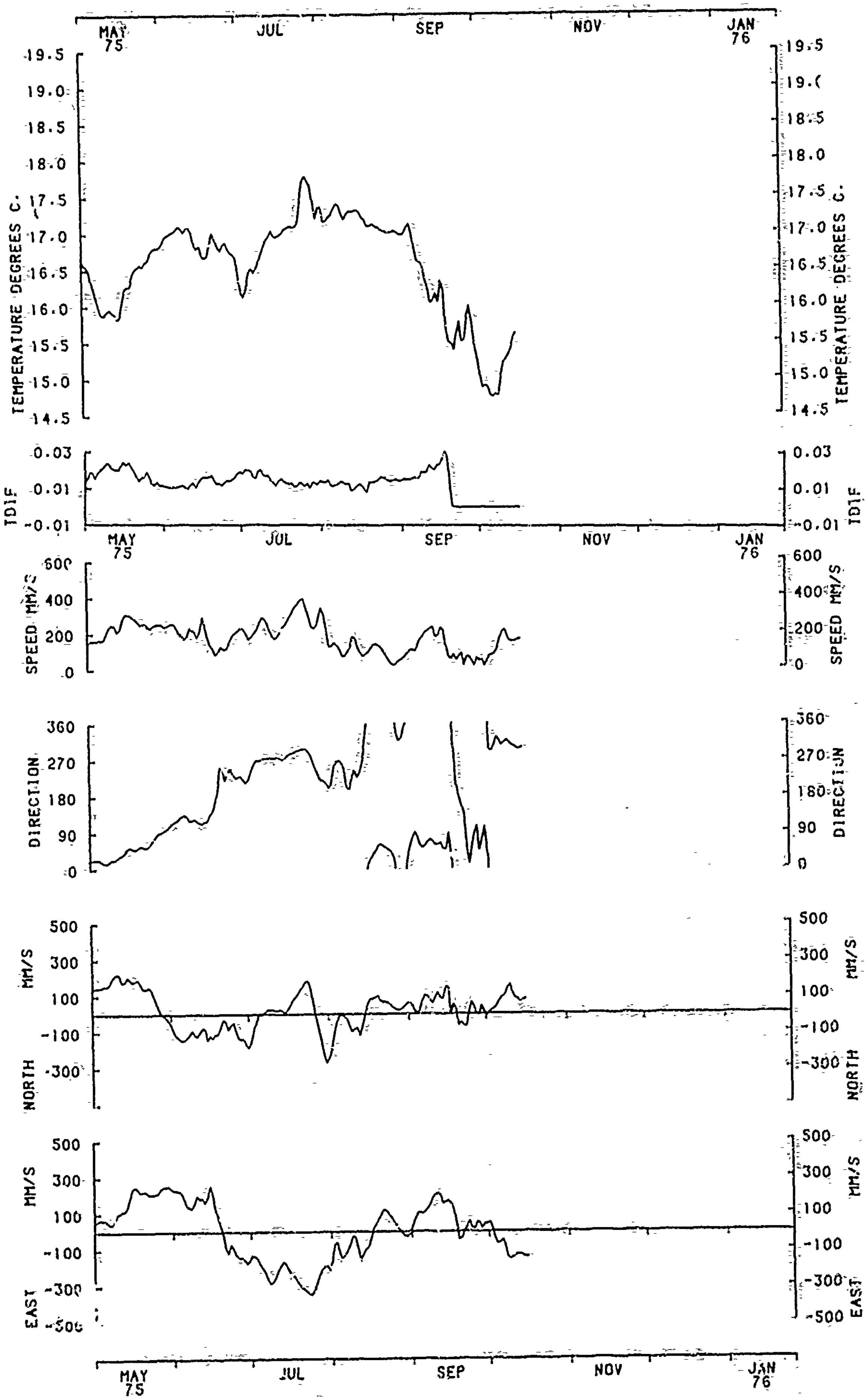
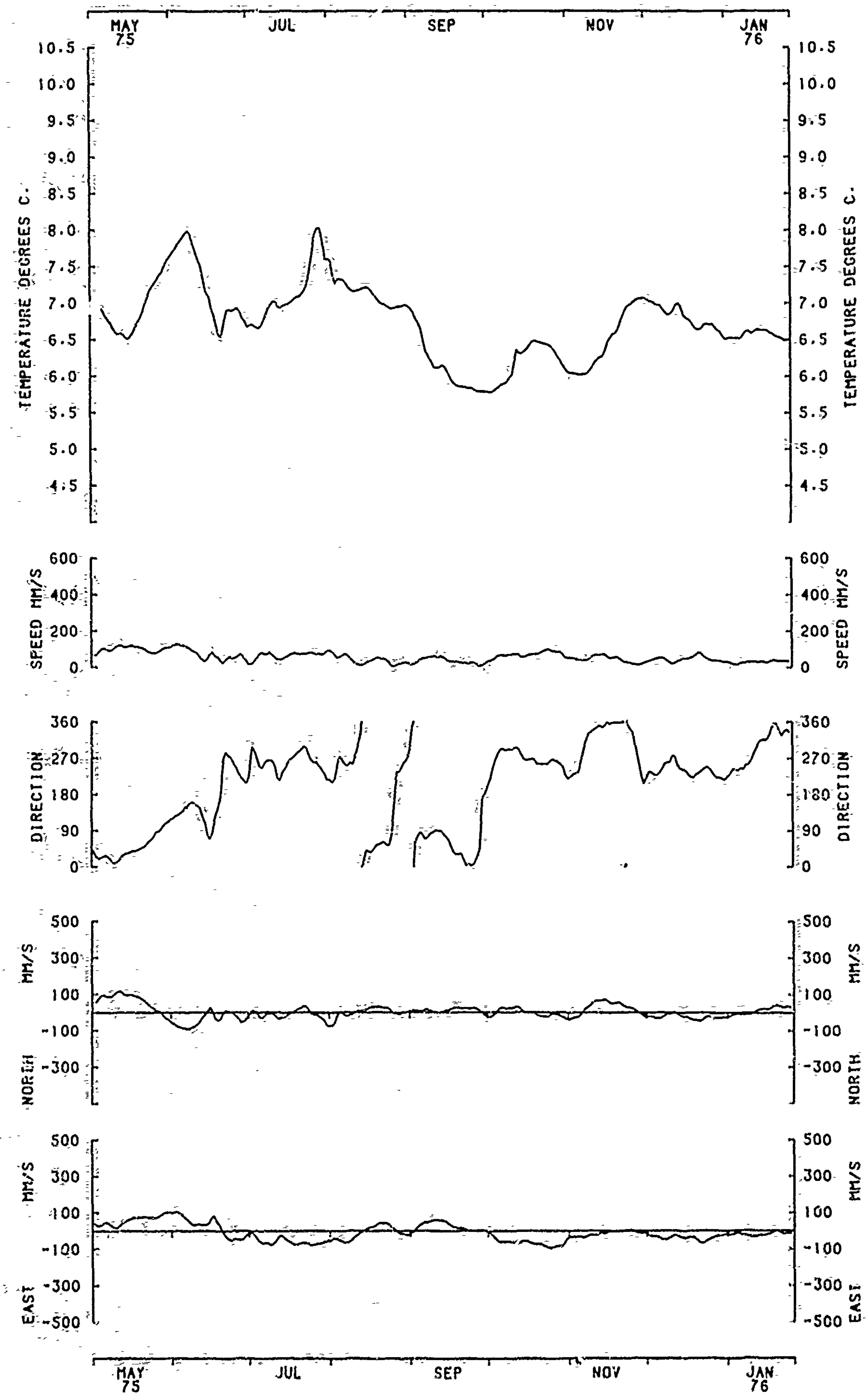


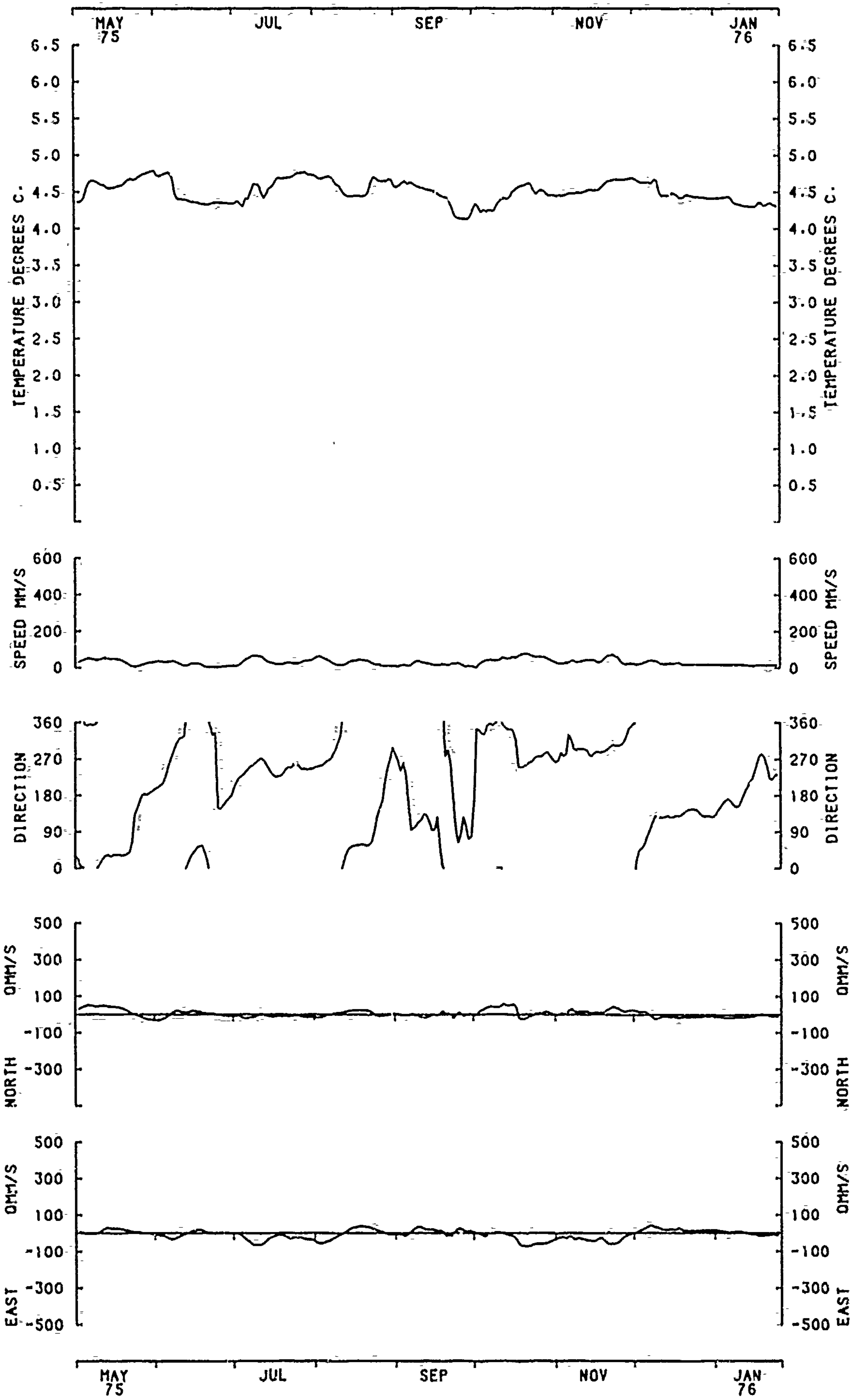
RECORD #5531A1DGAU24 DEPTH=306 METERS



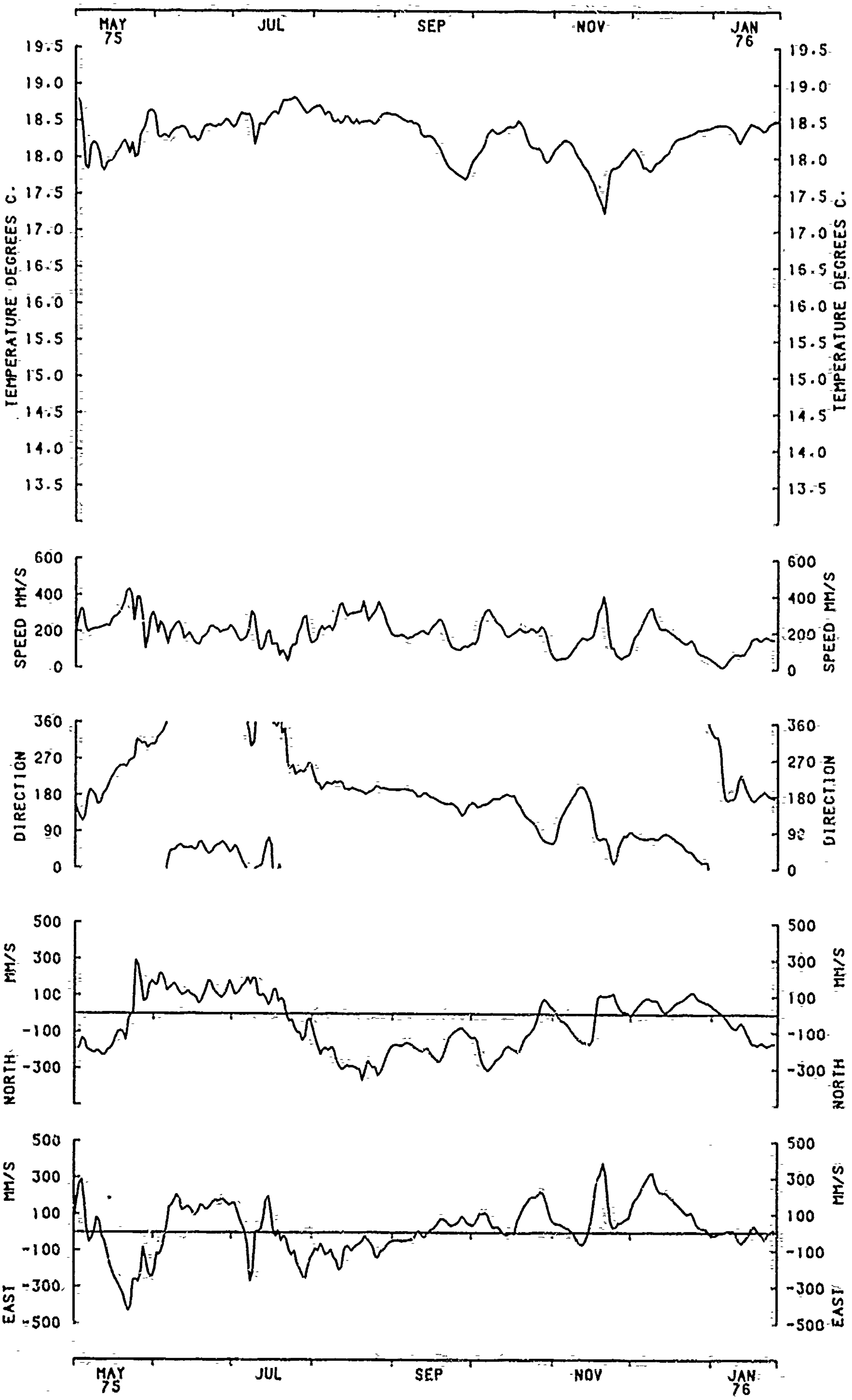
RECORD #5532P1DGAU24 DEPTH=506 METERS



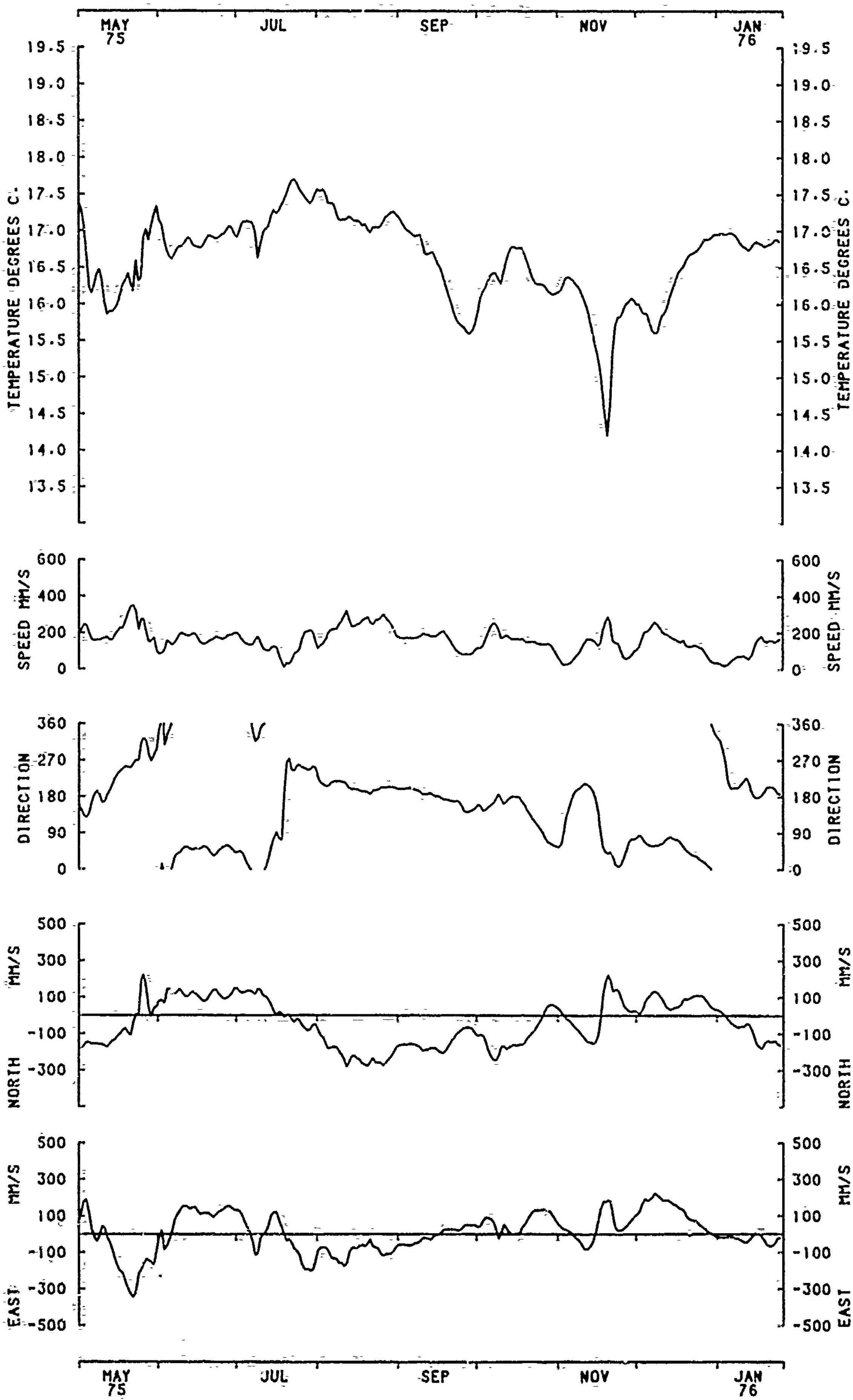
RECORD #5534A1DGAU24 DEPTH=1005 METERS



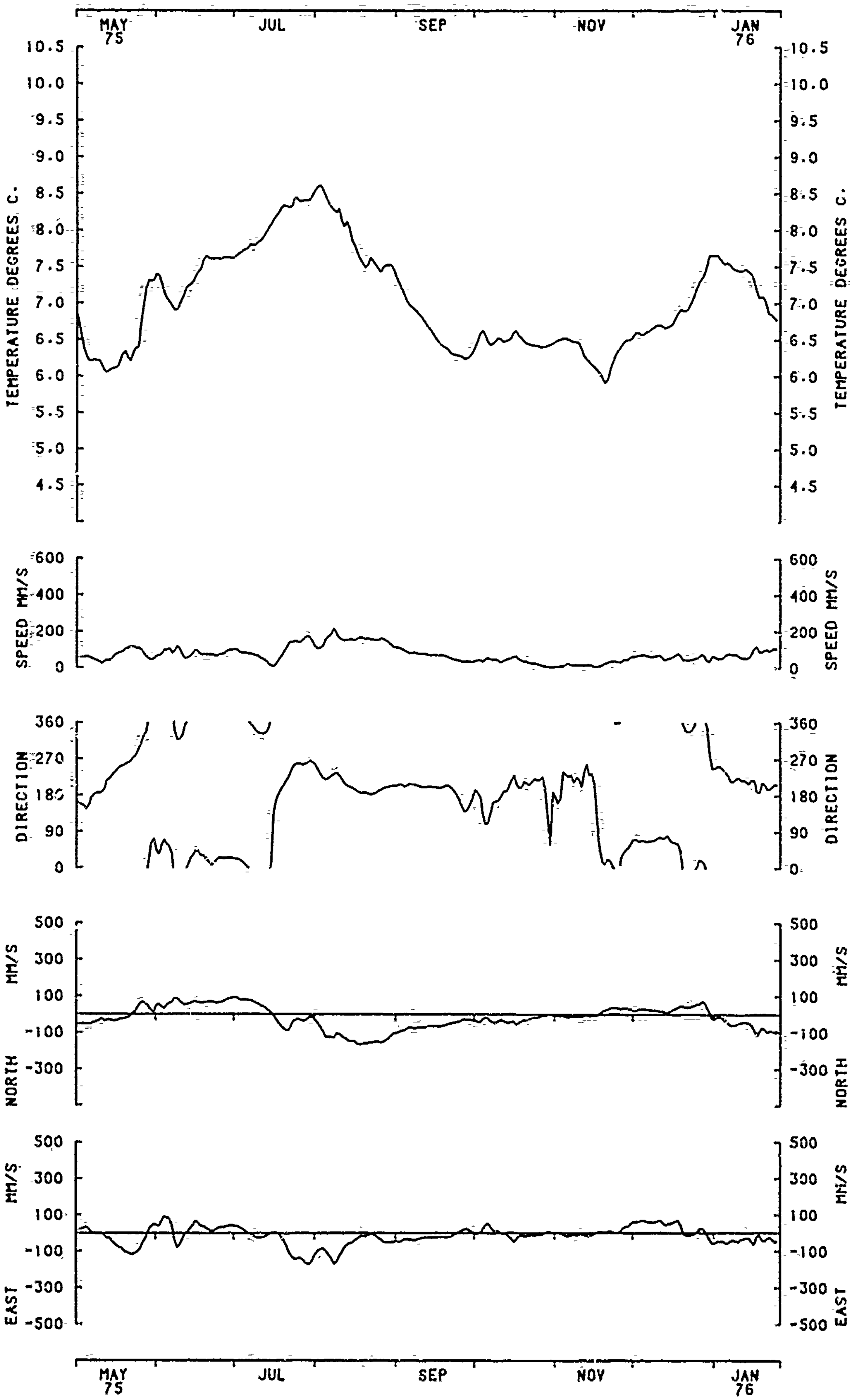
RECORD #5535A1DG240* DEPTH=1505 METERS



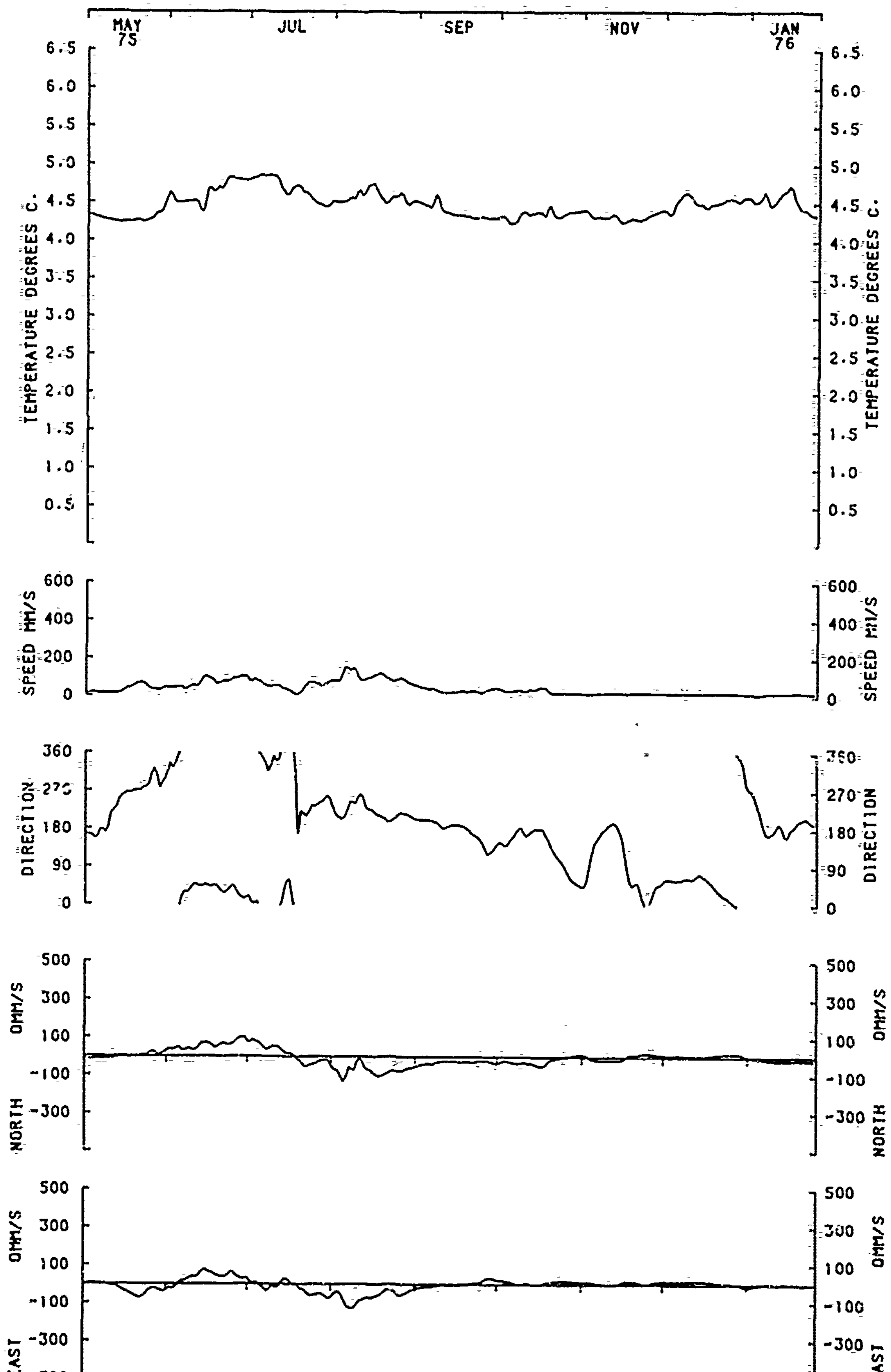
RECORD #5541A1DGAU24 DEPTH=314 METERS



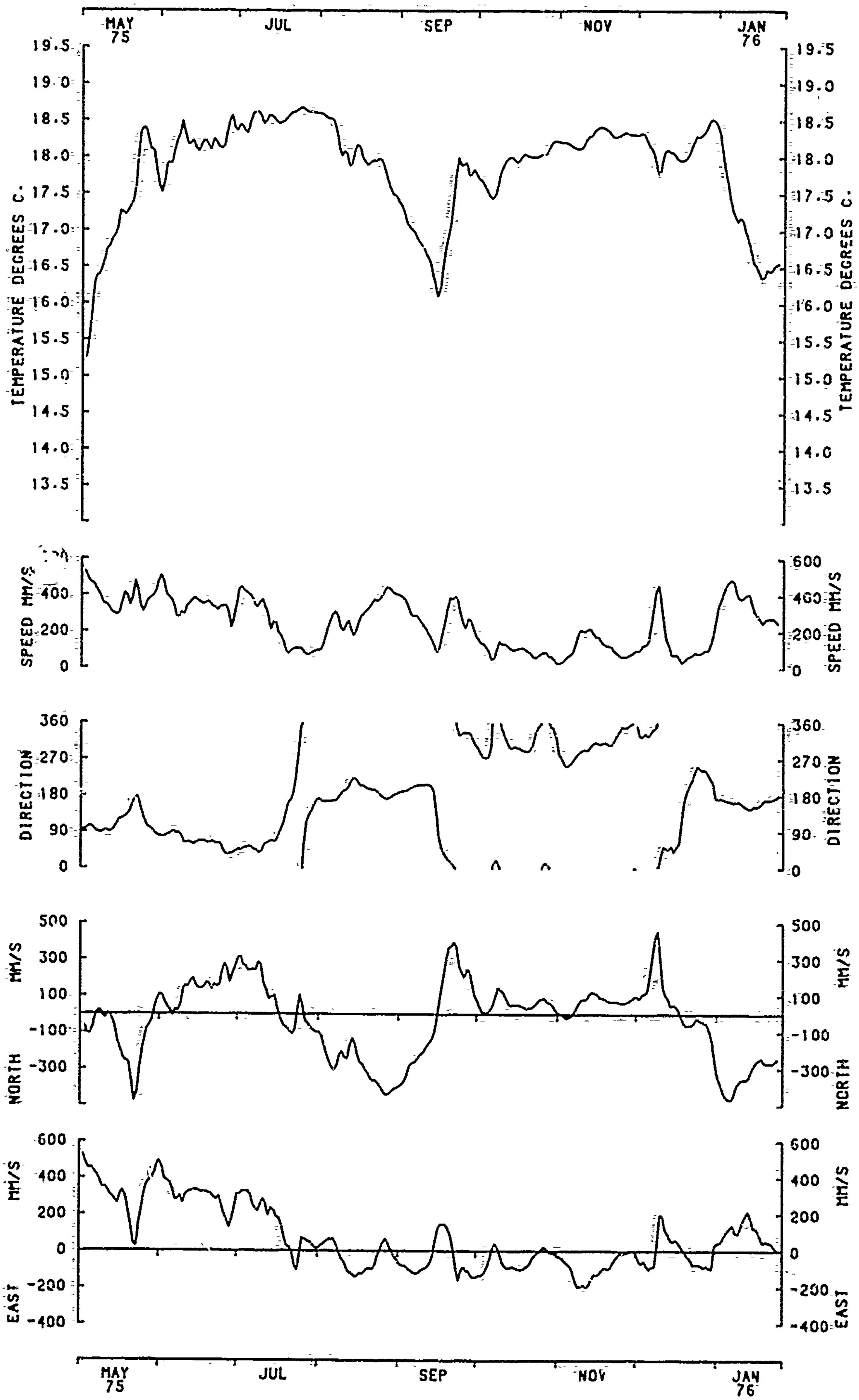
RECORD #5542A1DGAU24 DEPTH=514 METERS



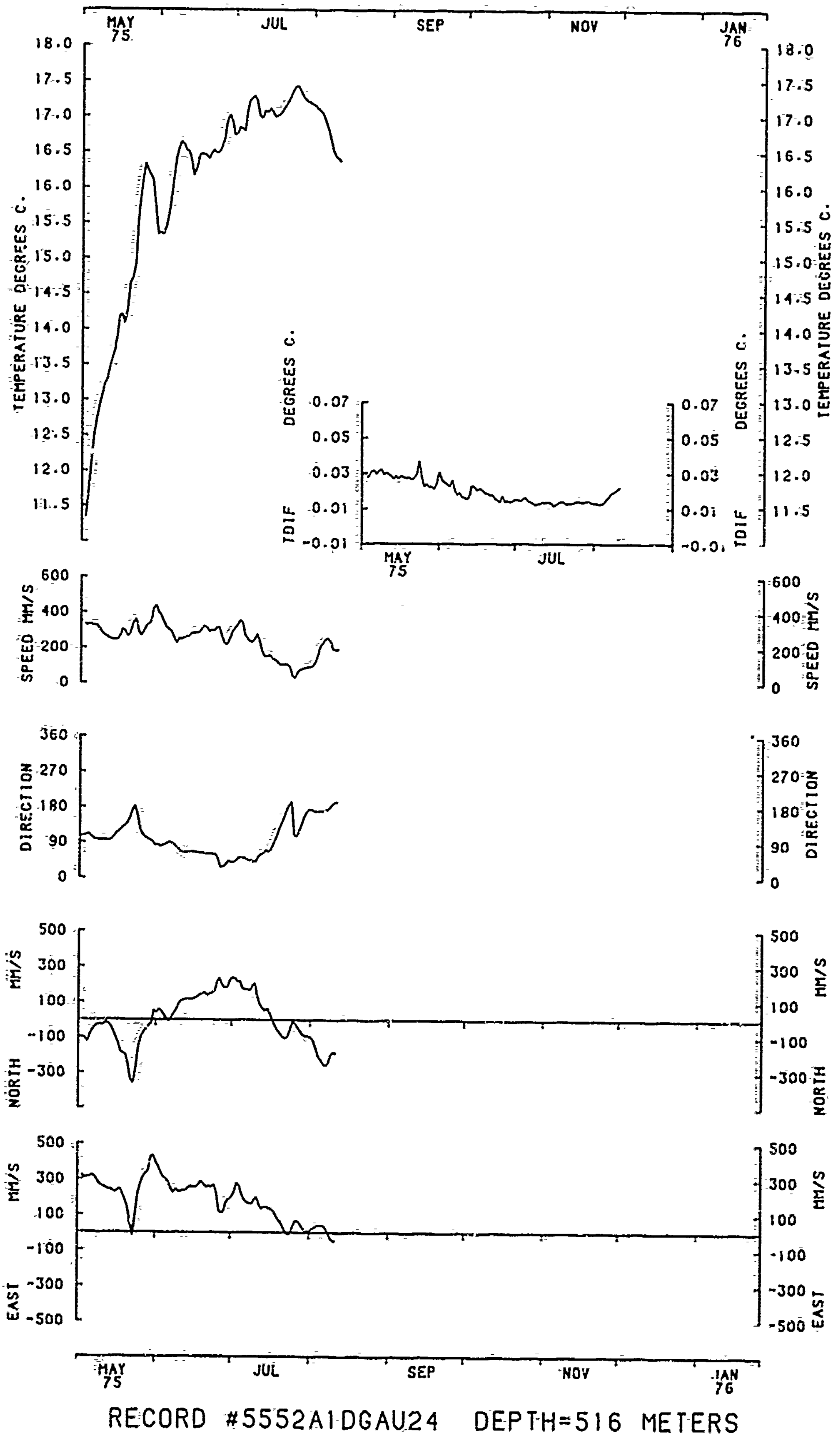
RECORD #5544A1DGAU24 DEPTH=1013 METERS



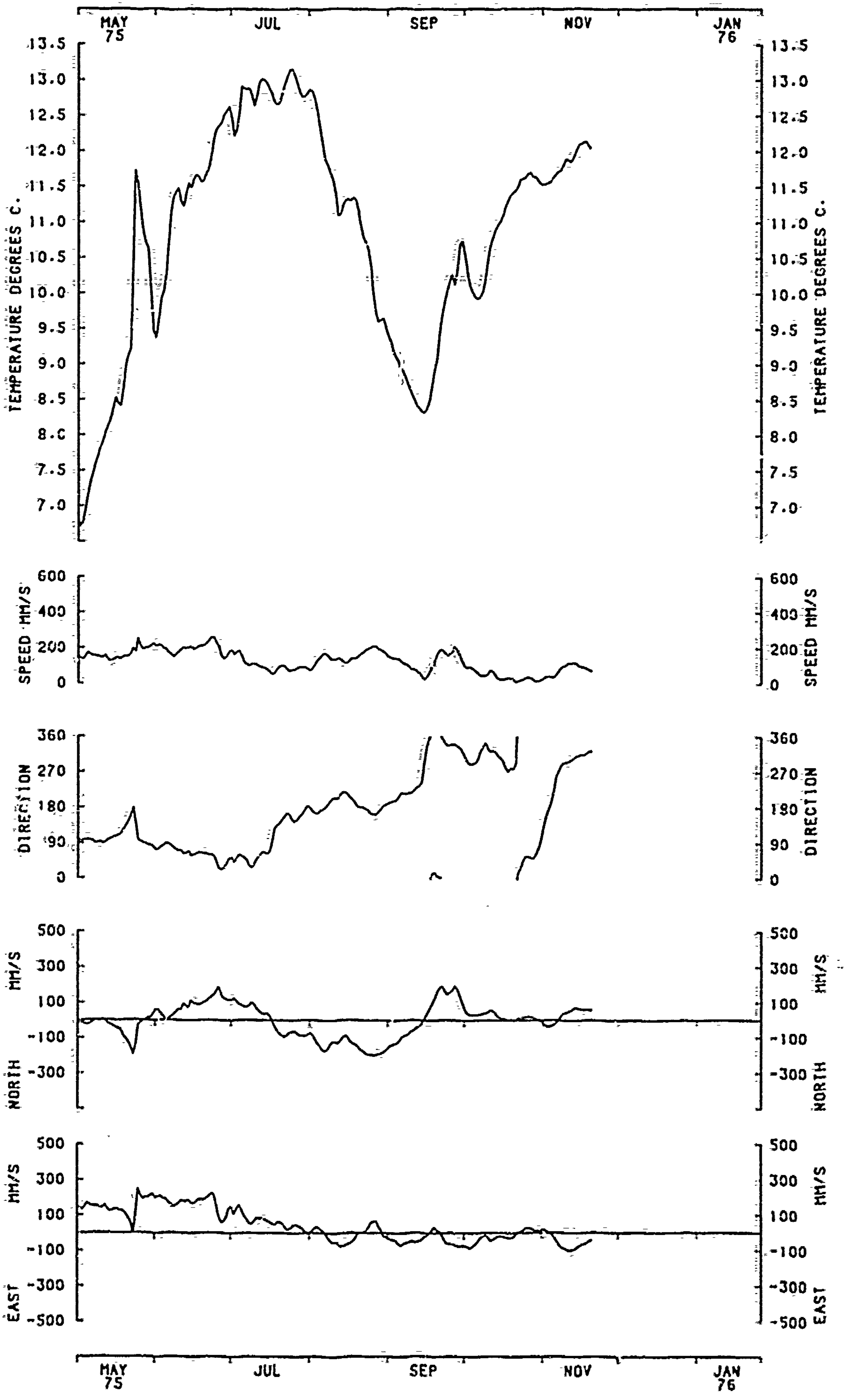
RECORD #5545A1DG240* DEPTH=1513 METERS



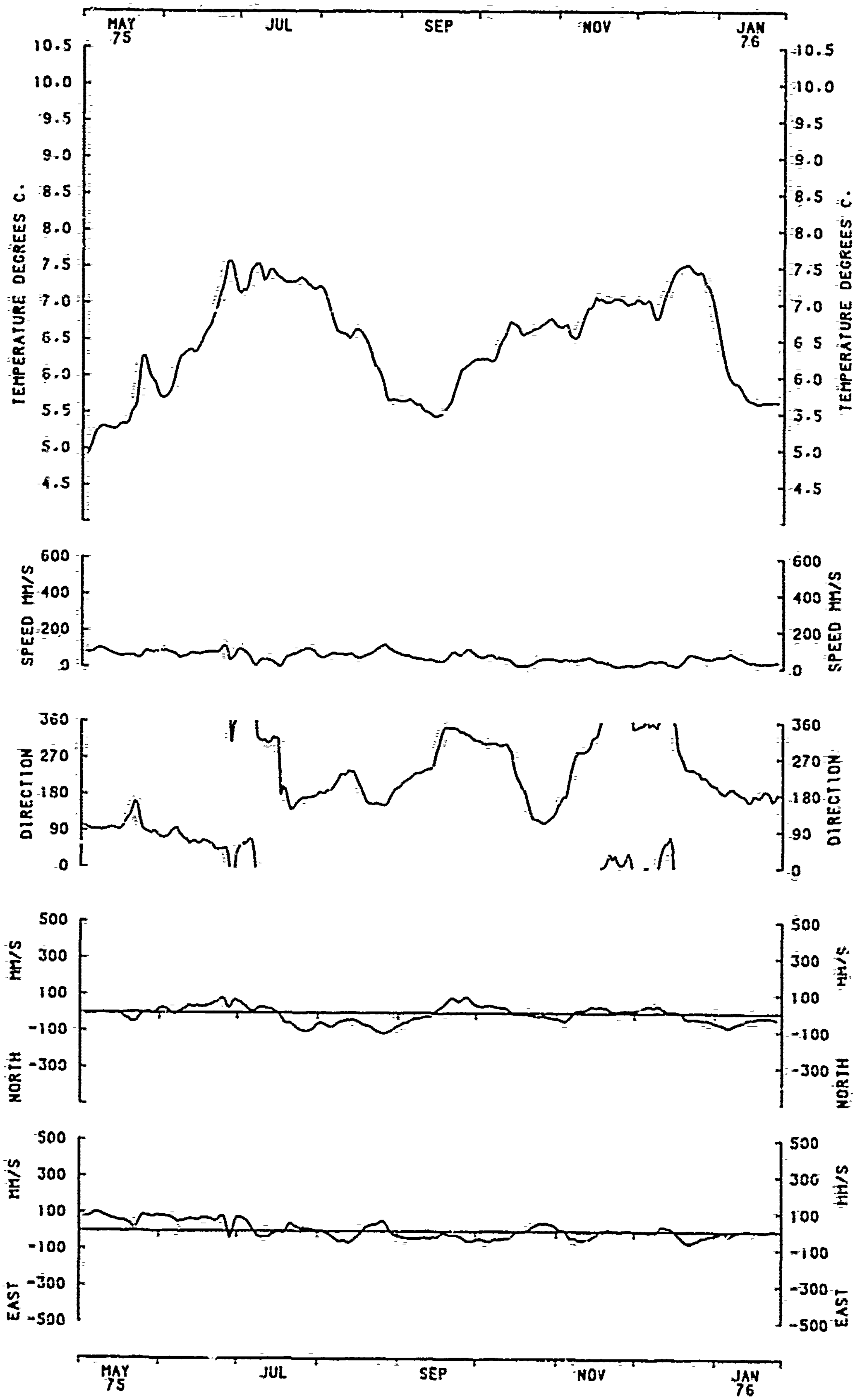
RECORD #5551A1DGAU24 DEPTH=316 METERS



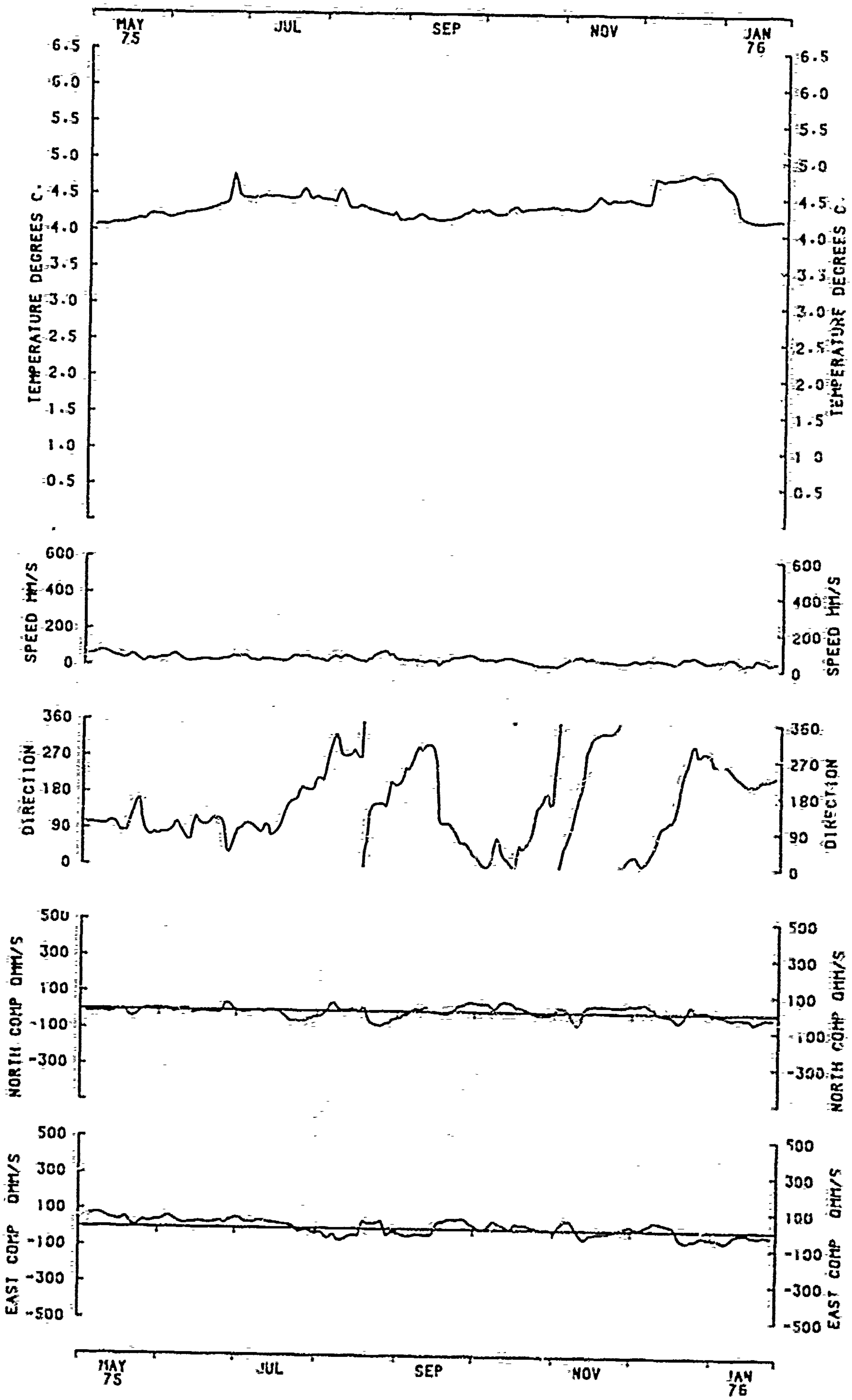
RECORD #5552A1DGAU24 DEPTH=516 METERS



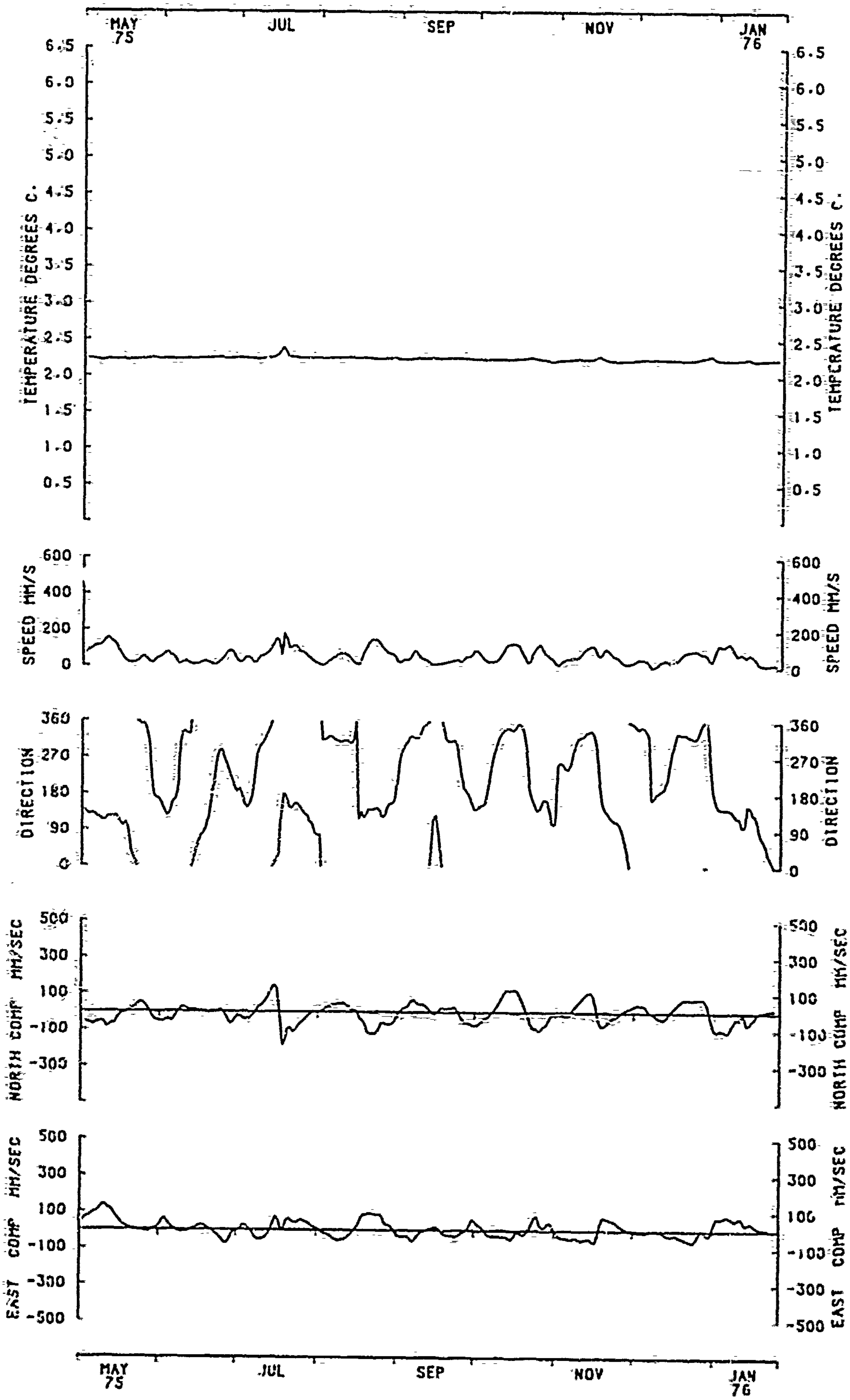
RECORD #5554A1DGAU24 DEPTH=766 METERS



RECORD #5555A1DGAU24 DEPTH=1016 METERS



RECORD #5556B1DG240• DEPTH=1516 METERS



RECORD #5557B1DGAU24 DEPTH=4016 METERS

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5555555555555    5555555555555              3333         11
           55               55               33          11
           55               55               33          11
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 55555555555      55555555555      33333333333           11
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5555555555555        5555555555555                 3333                22
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           55                   55                   33            22
55         55        55         55                   33          22
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55              55                         33     44  44
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 55555555555     55555555555     33333333333          44
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RR         RR                   MM MM    MM MM
RR         RR                   MM  MM  MM  MM
RRRRRRRRRRRRR                   MM   MMM    MM
RRRRRRRRRRRR                    MM    M     MM
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RR       RR                     MM          MM
RR        RR                    MM          MM
RR        RR                    MM          MM
RR        RR                    MM          MM
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UU         UU                       DDDDDDDDDDDD
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55              55                  44   44              11
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 55555555555     55555555555             44              11
```

```
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AA         AA
AA         AA
AAAAAAAAAAAAA
AAAAAAAAAAAAA
AA         AA
AA         AA
AA         AA
AA         AA
AA         AA
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```
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```
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 55555555555       55555555555
```

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4444444444444    4444444444444
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        44               44
        44               44
```

```
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MMMM     MMMM
MM MM   MM MM
MM  MM MM  MM
MM   MMM   MM
MM    M    MM
MM         MM
MM         MM
MM         MM
MM         MM
MM         MM
```

```
IIIIIIII
IIIIIIII
   II
   II
   II
   II
   II
   II
   II
   II
IIIIIIII
IIIIIIII
```

```
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5555555555555   5555555555555          44      5555555555555
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```

```
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 CC                                     RR         RR
 CC                                     RR         RR
 CC                                     RRRRRRRRRRRRR
 CC                                     RRRRRRRRRRRR
 CC                                     RR      RR
 CC                                     RR       RR
 CC         CC                          RR        RR
 CCCCCCCCCCCCC                          RR        RR
  CCCCCCCCCCC                           RR        RR
```

```
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55              55              55               1111
55              55              55                 11
55              55              55                 11
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           55              55              55      11
           55              55              55      11
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5555555555555   5555555555555   5555555555555      11
 55555555555     55555555555     55555555555       11
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00         00                         SS
00         00                         SS
00         00                         SSSSSSSSSSSS
00         00                          SSSSSSSSSSSS
00         00                                    SS
00         00                                    SS
00         00                         SS         SS
0000000000000                         SSSSSSSSSSSSS
 00000000000                           SSSSSSSSSS
```

```
5555555555555   5555555555555   5555555555555    22222222222
5555555555555   5555555555555   5555555555555   2222222222222
55              55              55              22         22
55              55              55                         22
55              55              55                         22
555555555555    555555555555    555555555555              22
5555555555555   5555555555555   5555555555555           22
           55              55              55         22
           55              55              55       22
55         55   55         55   55         55     22
5555555555555   5555555555555   5555555555555   2222222222222
 55555555555     55555555555     55555555555    2222222222222
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TTTTTTTTTTTT                                    RRRRRRRRRRRR
TTTTTTTTTTTT                                    RRRRRRRRRRRRR
     TT                                         RR          RR
     TT                                         RR          RR
     TT                                         RR          RR
     TT                                         RRRRRRRRRRRRR
     TT                                         RRRRRRRRRRRR
     TT                                         RR      RR
     TT                                         RR        RR
     TT                                         RR         RR
     TT                                         RR         RR
     TT                                         RR         RR
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5555555555555   5555555555555   5555555555555    33333333333
5555555555555   5555555555555   5555555555555   3333333333333
55              55              55              33         33
55              55              55                         33
55              55              55                         33
555555555555    555555555555    555555555555             3333
5555555555555   5555555555555   5555555555555            3333
           55              55              55              33
           55              55              55              33
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5555555555555   5555555555555   5555555555555   3333333333333
 55555555555     55555555555     55555555555     33333333333
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5555555555555    5555555555555    5555555555555           44
5555555555555    5555555555555    5555555555555          444
55               55               55                    4444
55               55               55                   44 44
55               55               55                  44  44
555555555555     555555555555     555555555555       44   44
5555555555555    5555555555555    5555555555555     44    44
           55               55               55     444444444444
           55               55               55     444444444444
55         55    55         55    55         55            44
5555555555555    5555555555555    5555555555555            44
 55555555555      55555555555      55555555555             44



          UU        UU                             CCCCCCCCCCC
          UU        UU                            CCCCCCCCCCCCC
          UU        UU                            CC         CC
          UU        UU                            CC
          UU        UU                            CC
          UU        UU                            CC
          UU        UU                            CC
          UU        UU                            CC
          UU        UU                            CC
          UU        UU                            CC         CC
          UUUUUUUUUUUU                            CCCCCCCCCCCCC
           UUUUUUUUUU                              CCCCCCCCCCC
```

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5555555555555    5555555555555    5555555555555    5555555555555
5555555555555    5555555555555    5555555555555    5555555555555
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55               55               55               55
55               55               55               55
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 55555555555      55555555555      55555555555      55555555555
```

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TTTTTTTTTTTT                              UU          UU
TTTTTTTTTTTT                              UU          UU
     TT                                   UU          UU
     TT                                   UU          UU
     TT                                   UU          UU
     TT                                   UU          UU
     TT                                   UU          UU
     TT                                   UU          UU
     TT                                   UU          UU
     TT                                   UU          UU
     TT                                   UUUUUUUUUUUUUU
     TT                                    UUUUUUUUUUUU
```

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           55               55               55    66         66
55         55    55         55    55         55    66         66
5555555555555    5555555555555    5555555555555    6666666666666
 55555555555      55555555555      55555555555      66666666666


         RRRRRRRRRRRR                              EEEEEEEEEEEEE
         RRRRRRRRRRRRR                             EEEEEEEEEEEEE
         RR        RR                              EE
         RR        RR                              EE
         RR        RR                              EE
         RRRRRRRRRRRRR                             EEEEEEEE
         RRRRRRRRRRRR                              EEEEEEEE
         RR      RR                                EE
         RR       RR                               EE
         RR        RR                              EE
         RR        RR                              EEEEEEEEEEEEE
         RR        RR                              EEEEEEEEEEEEE
```

```
5555555555555    5555555555555    5555555555555    77777777777777
5555555555555    5555555555555    5555555555555    777777777777
55               55               55               77        77
55               55               55                        77
55               55               55                       77
555555555555     555555555555     555555555555           77
5555555555555    5555555555555    5555555555555          77
           55               55               55         77
           55               55               55         77
55         55    55         55    55         55        77
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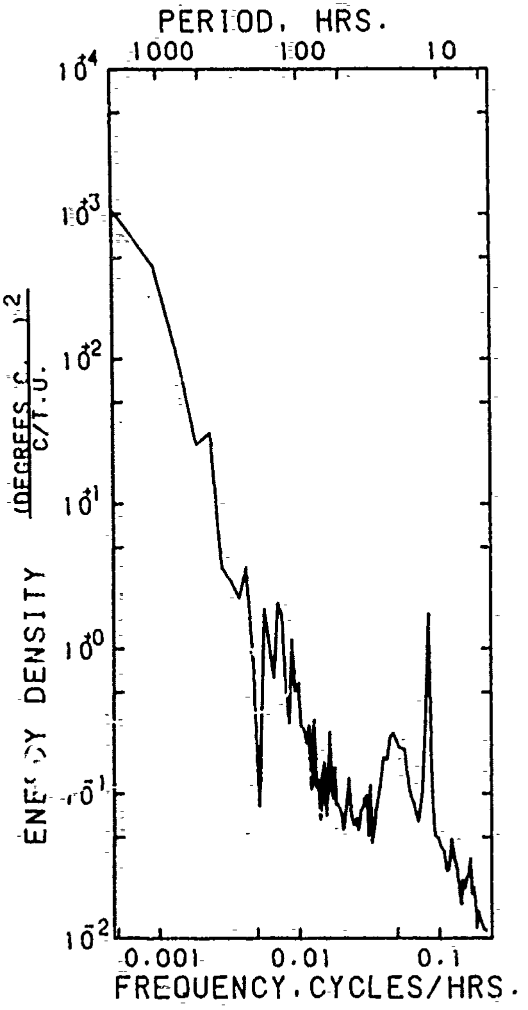
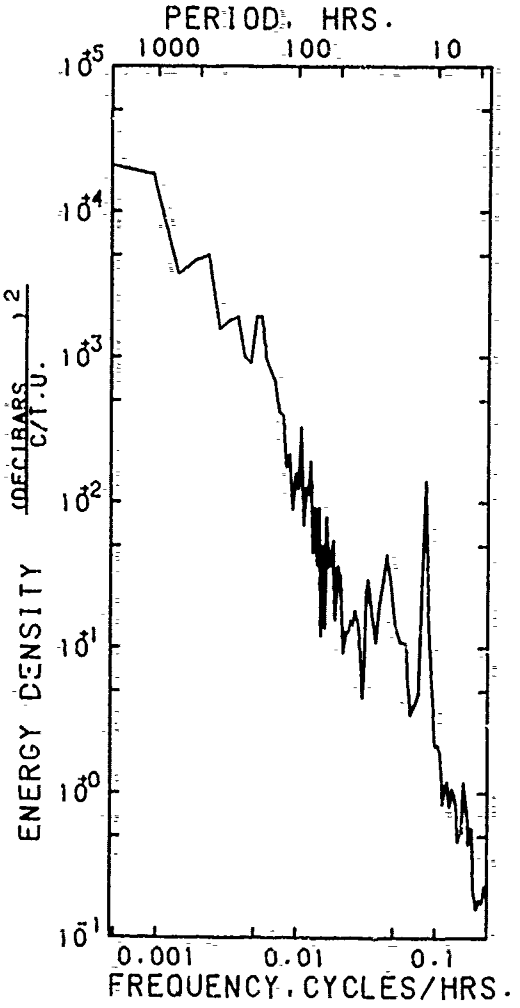
```

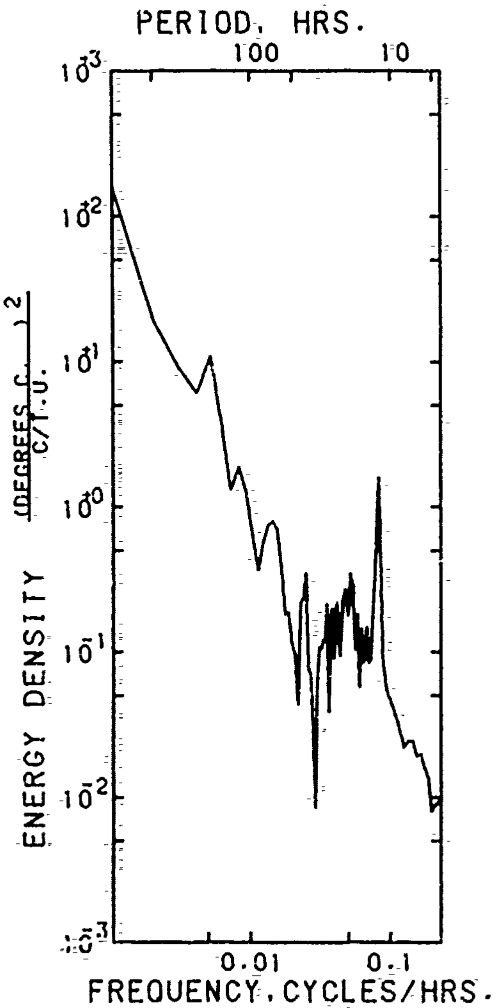


AUTO SPECTRUM
5533$1920 TEMPERATURE
735 METERS
75-IV-29 TO 76-1-21
1 PIECES WITH 1500 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

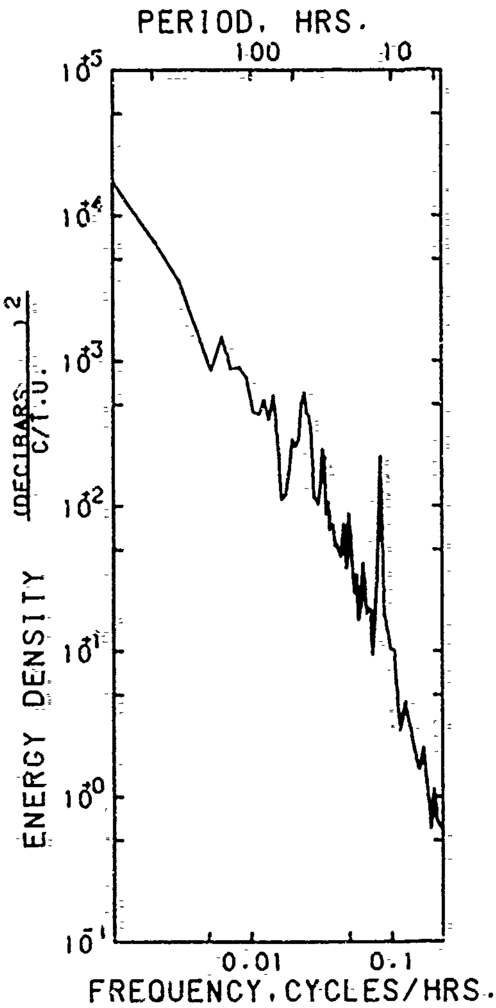


AUTO SPECTRUM
5533$1920 PRESSURE
735 METERS
75-IV-29 TO 76-1-21
1 PIECES WITH 1500 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

```
*************************************************************************
** 5533$1920     ** 12220 POINTS  FROM 75. IV .29  TO 76.  I .26
INST. TD#15     DEPTH  734 M.   UNITS = DEGREES , DECIBARS
VARIABLE --- TEMPERATURE -- PRESSURE ------------------------------------
MEAN          =     12.210       741.962
STD.ERR.      =      .113E-1       .529E-1
VARIANCE      =      1.547        34.163
KURTOSIS      =      2.632        12.252
SKEWNESS      =     -.632          2.687
MINIMUM       =      8.824       737.401
MAXIMUM       =     14.912       782.572
*************************************************************************
```

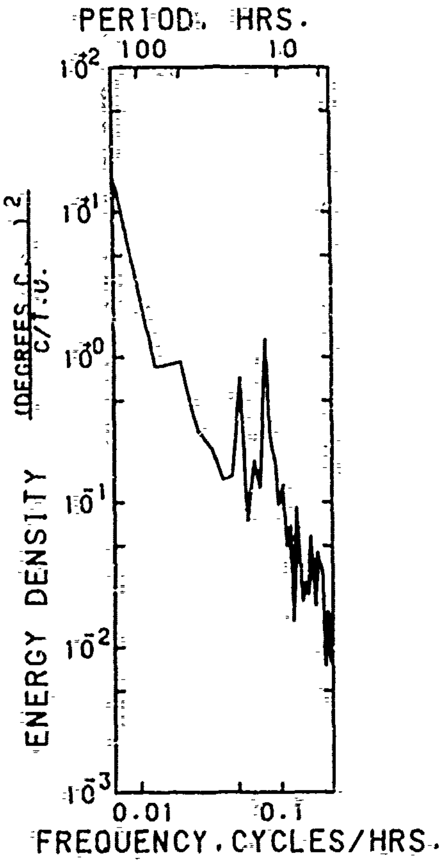


AUTO SPECTRUM
5543$1920 TEMPERATURE
719 METERS
75-IV-29 TO 75-VIII-27
1 PIECES WITH 675 ESTIMATES
PER PIECE, AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

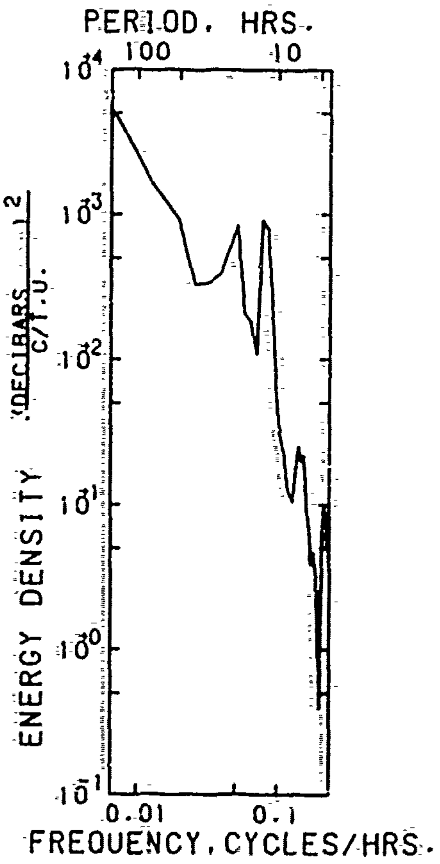


AUTO SPECTRUM
5543$1920 PRESSURE
719 METERS
75-IV-29 TO 75-VIII-27
1 PIECES WITH 675 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

```
*****************************************************************
** 5543$1920     **  5450 POINTS  FROM 75- IV -29   TO 75-VIII-29
INST.            DEPTH  718 M.    UNITS = DEGREES , DECIBARS
VARIABLE --- TEMPERATURE -- PRESSURE ---------------------------
MEAN        =     13.404        725.388
STD.ERR.    =      .124E-1        .992E-1
VARIANCE    =      .841         54.056
KURTOSIS    =     2.623         10.481
SKEWNESS    =     -.476          2.199
MINIMUM     =     11.122        718.109
MAXIMUM     =     15.177        785.999
*****************************************************************
```



AUTO SPECTRUM
5553$1920 TEMPERATURE
753 METERS
75-IV-29 TO 75-V-19
1 PIECES WITH 108 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

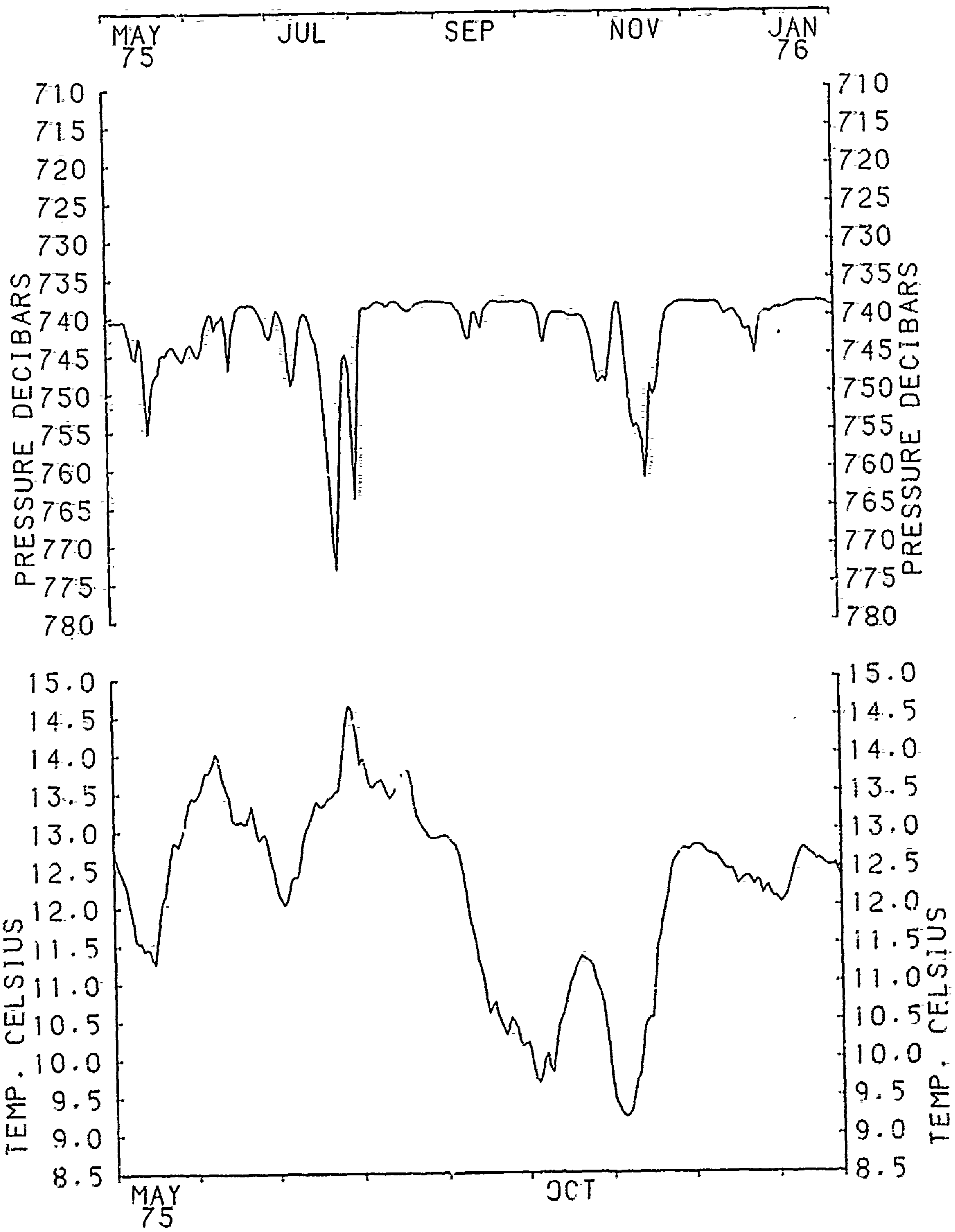


AUTO SPECTRUM
5553$1920 PRESSURE
753 METERS
75-IV-29 TO 75-V-19
1 PIECES WITH 108 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

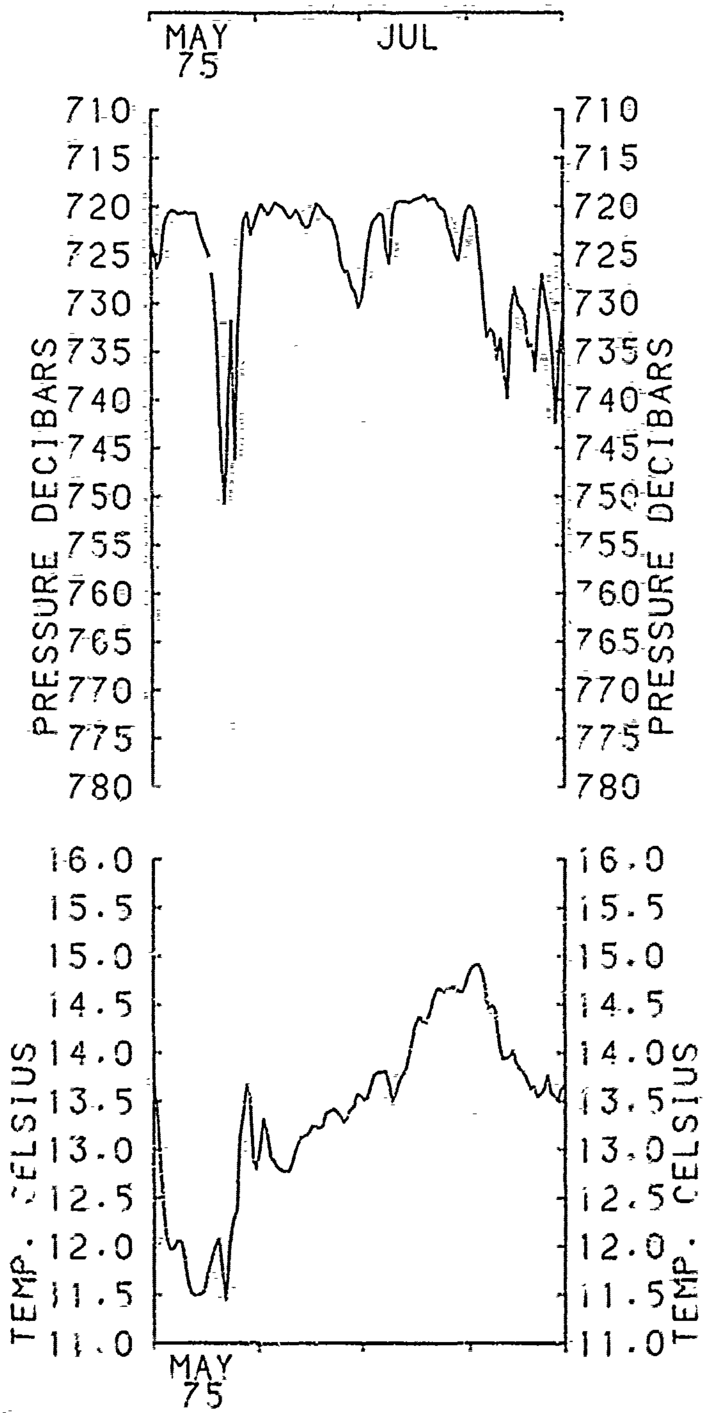
****
** 5553$1920 ** 924 POINTS FROM 75- IV -29 TO 75- V -20
INST. DEPTH 752 M. UNITS = DEGREES , DECIBARS

VARIABLE ---	TEMPERATURE --	PRESSURE ------------------
MEAN =	8.253	759.786
STD.ERR. =	.245E-1	.501
VARIANCE =	.554	232.321
KURTOSIS =	1.978	2.514
SKEWNESS =	-.127	.441
MINIMUM =	6.702	719.252
MAXIMUM =	9.767	802.928

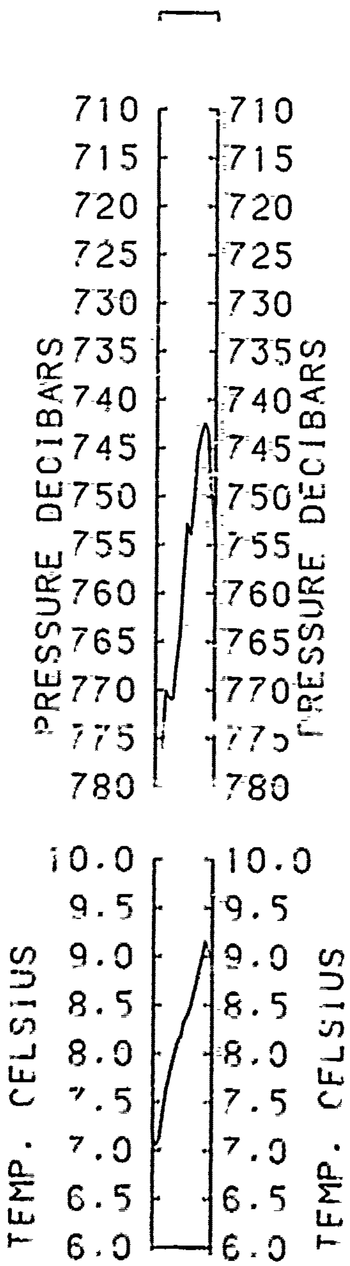
****



DATA 5533$1DGAU24



DATA 5543$10CW24


PRESSURE DECIBARS
710
715
720
725
730
735
740
745
750
755
760
765
770
775
780
TEMP. CELSIUS
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0

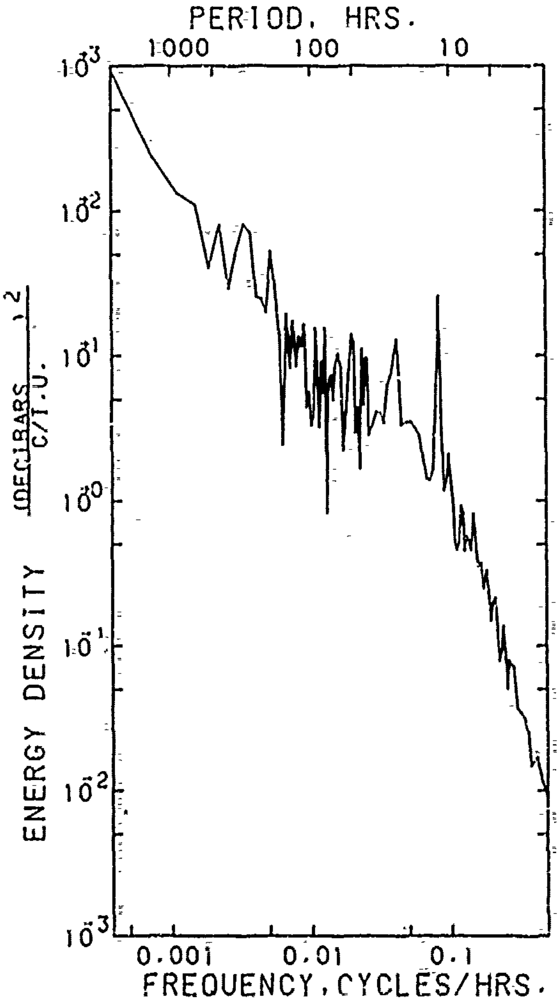
****

** 6331A900 ** 36720 POINTS FROM 77- XI -16 TO 78- XII-03

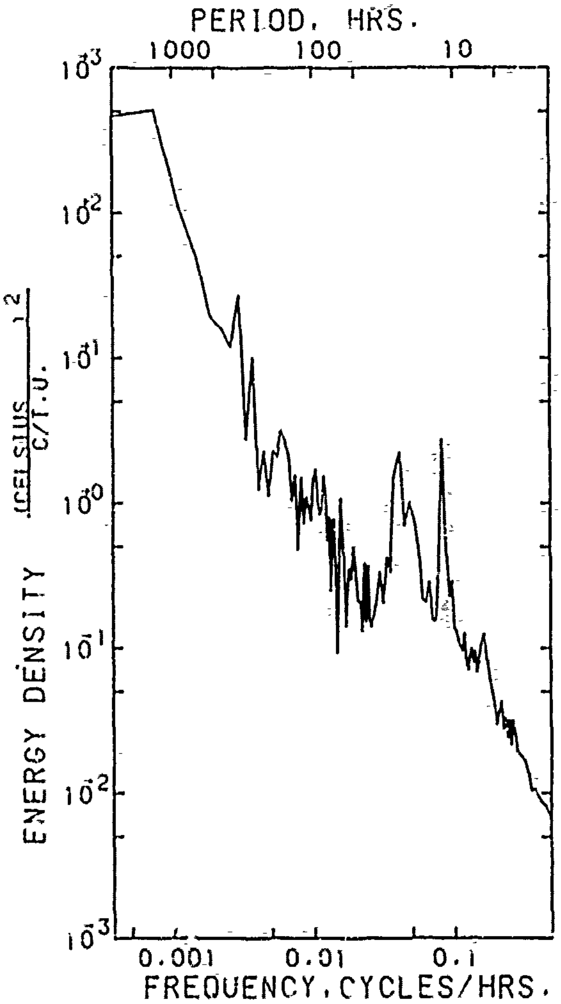
INST. V-0325P DEPTH 792 M. UNITS = DBARS , DEGREES CELSIUS

VARIABLE		PRESSURE	TEMPERATURE
MEAN	=	798.335	10.928
STD.ERR.	=	.857E-2	.632E-2
VARIANCE	=	2.697	1.466
KURTOSIS	=	38.235	4.866
SKEWNESS	=	4.446	-.709
MINIMUM	=	794.203	6.243
MAXIMUM	=	819.586	14.296

****



AUTO SPECTRUM
6331A1H PRESSURE
792 METERS
77-XI-16 TO 78-X-15
1 PIECES WITH 4000 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
6331A1H TEMPERATURE
792 METERS
77-XI-16 TO 78-X-15
1 PIECES WITH 4000 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

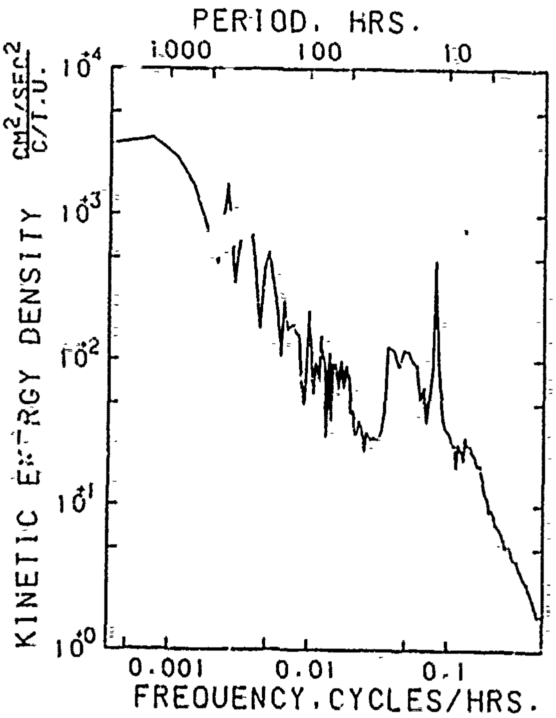
** 6332B900 ** 36720 POINTS FROM 77- XI -16 TO 78- XII-03

INST. V-0139 DEPTH 1092 M. UNITS = MM/SEC , DEGREES CELSIUS

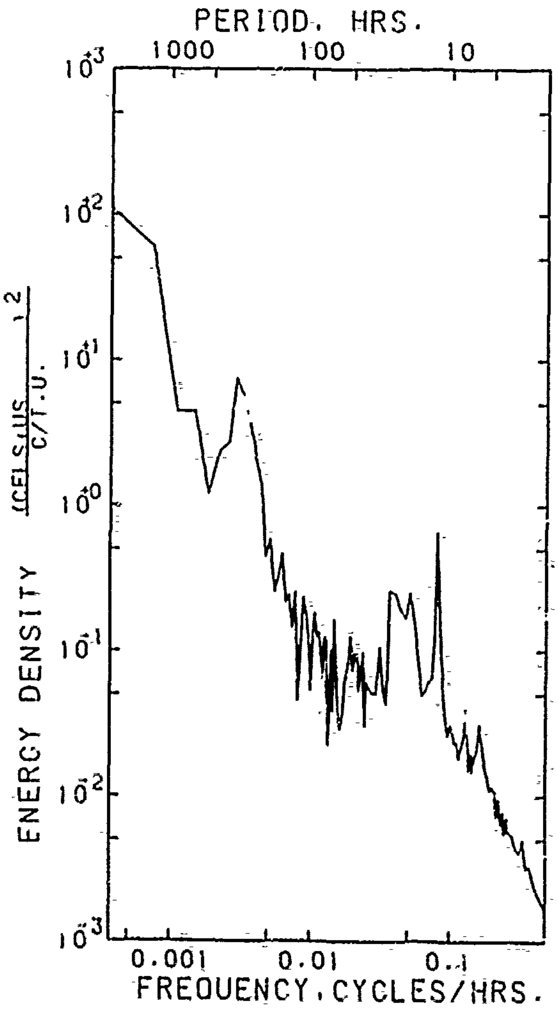
VARIABLE		EAST	NORTH	SPEED	TEMPERATURE
MEAN	=	3.840	-1.995	59.345	6.048
STD.ERR.	=	.308	.174	.173	.237E-2
VARIANCE	=	3483.713	1112.673	1093.306	.206
KURTOSIS	=	3.514	2.937	5.324	5.375
SKEWNESS	=	-.441	.219E-1	1.345	.893
MINIMUM	=	-255.262	-129.108	1.944	4.758
MAXIMUM	=	202.680	137.924	257.547	8.242

-----EAST & NORTH--------

COVARIANCE	=	135.735
CORR. COEF.	=	.689E-1
ORIENTATION	=	86.734
MAJAX	=	59.089
MINAX	=	33.240
ELLIP	=	.437



AUTO SPECTRUM
6332B1H EAST
6332B1H NORTH
1092 METERS
77-XI-16 TO 78-X-15
1 PIECES WITH 4000 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
6332B1H TEMPERATURE
1092 METERS
77-XI-16 TO 78-X-15
1 PIECES WITH 4000 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

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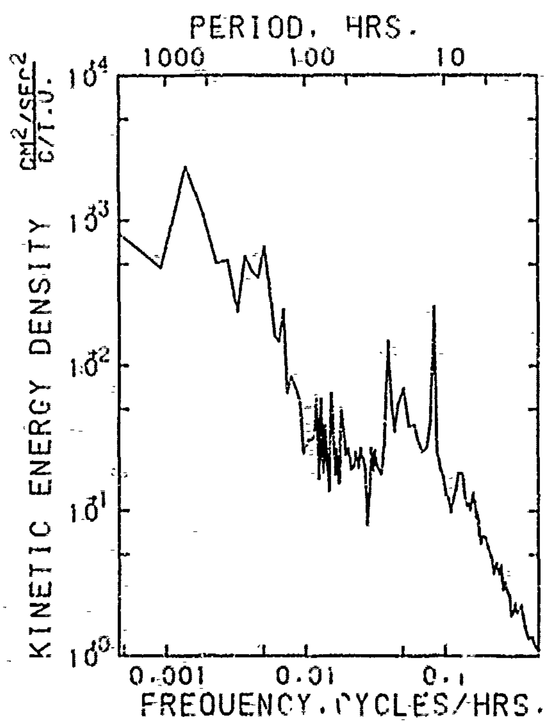
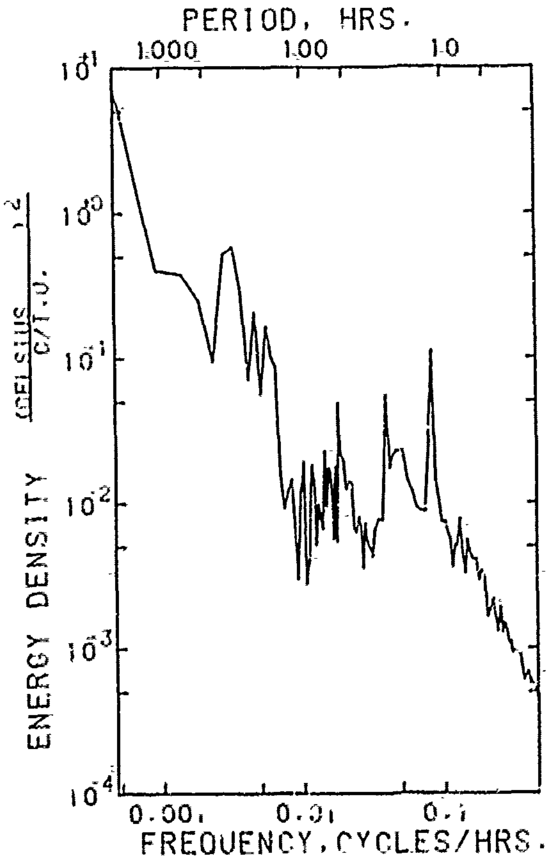
*************************************************************************
** 6333AC900     ** 26478 POINTS  FROM 77- XI -16  TO 78-VIII-18
INST.  V-0183  DEPTH 1392 M.   UNITS = MM/SEC , DEGREES CELSIUS
VARIABLE ------- EAST ------ NORTH ----- SPEED ---- TEMPERATURE
MEAN        =     -1.097         -.222        41.588        4.661
STD.ERR.    =       .243          .149          .127         .104E-2
VARIANCE    =   1560.879       591.427       423.965         .284E-1
KURTOSIS    =      3.048         2.922         5.723        3.055
SKEWNESS    =     -.876E-1        .234         1.465         .677
MINIMUM     =  -160.865        -89.635         1.393        4.293
MAXIMUM     =   148.623        103.375       164.941        5.349
-----EAST & NORTH-------- * * * * * * * * * * * * * * * * * * * *
COVARIANCE   =    210.115   *
CORR. COEF.  =       .219   *
ORIENTATION  =     78.282   *
MAJAX        =     40.056   *
MINAX        =     23.406   *
ELLIP        =       .416   *
*************************************************************************
```



AUTO SPECTRUM
6333AC1H EAST
6333AC1H NORTH
1392 METERS
77-XI-16 TO 78-VIII-13
1 PIECES WITH 3240 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
6333AC1H TEMPERATURE
1392 METERS
77-XI-16 TO 78-VIII-13
1 PIECES WITH 3240 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

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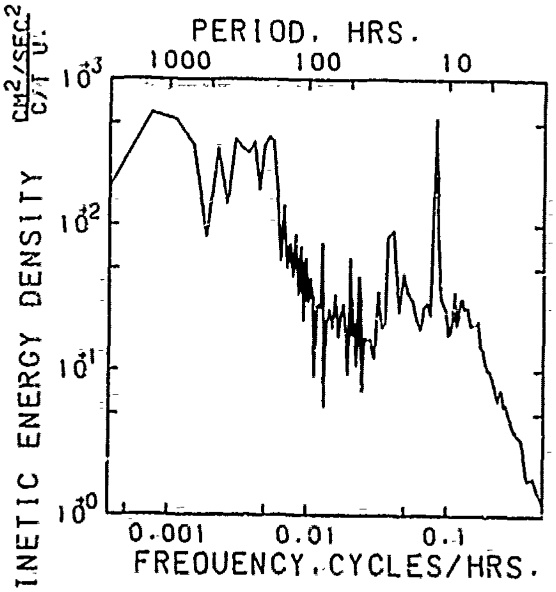
** 63348900 ** 36720 POINTS FROM 77- XI -16 TO 78- XII-03

INST. V-0122 DEPTH 1692 M. UNITS = MM/SEC , DEGREES CELSIUS

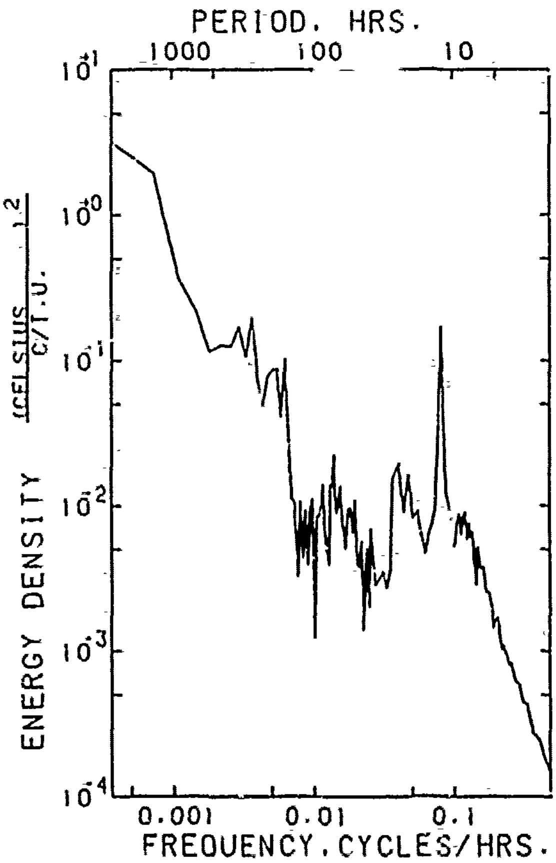
VARIABLE		EAST	NORTH	SPEED	TEMPERATURE
MEAN	=	3.110	1.515	42.854	4.128
STD.ERR.	=	.203	.140	.105	.542E-3
VARIANCE	=	1505.893	720.920	402.288	.108E-1
KURTOSIS	=	2.969	2.813	5.036	3.549
SKEWNESS	=	.522E-1	-.806E-2	1.317	.432
MINIMUM	=	-148.917	-105.595	2.715	3.775
MAXIMUM	=	147.724	108.069	151.797	4.583

-----EAST & NORTH--------		
COVARIANCE	=	66.773
CORR. COEF.	=	.641E-1
ORIENTATION	=	85.172
MAJAX	=	38.878
MINAX	=	26.745
ELLIP	=	.312

****



AUTO SPECTRUM
6334B1H EAST
6334B1H NORTH
1692 METERS
77-XI-16 TO 78-X-15
1 PIECES WITH 4000 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
6334B1H TEMPERATURE
1692 METERS
77-XI-16 TO 78-X-15
1 PIECES WITH 4000 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

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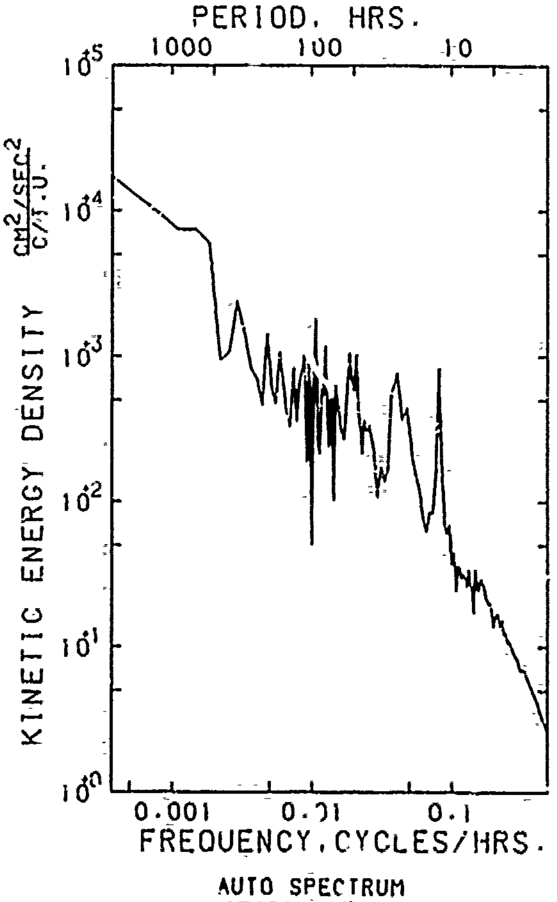
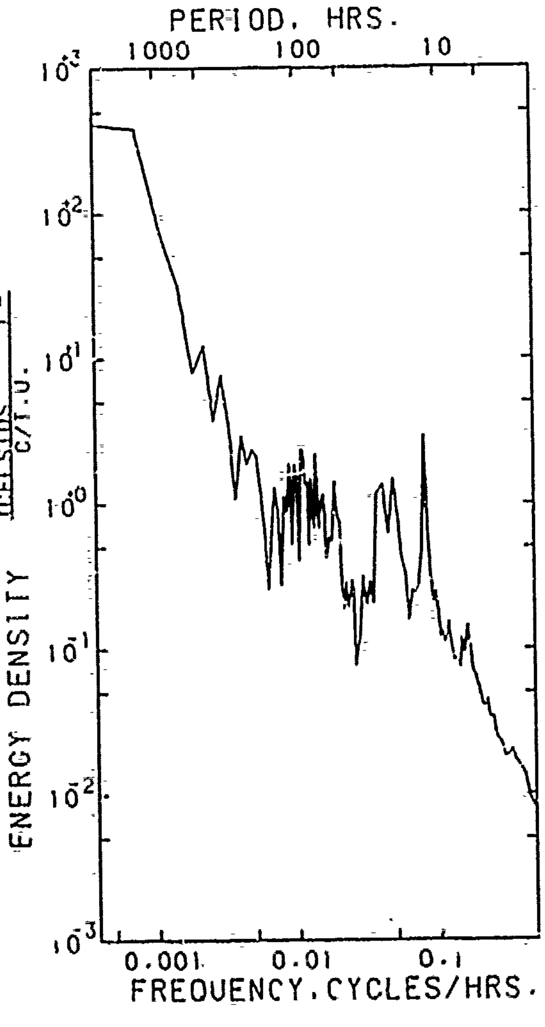
***************************************************************
** 6342A900      ** 37908 POINTS  FROM 77- XI -16  TO 78- XII-16
INST. V0113     DEPTH  542 M.    UNITS = MM/SEC , DEGREES CELSIUS
VARIABLE ------- EAST ------ NORTH ----- SPEED ---- TEMPERATURE
MEAN        =    18.697        -.800       89.850        12.309
STD.ERR.    =      .501         .212         .303         .855E-2
VARIANCE    =  9498.162     1699.979     3475.318         2.774
KURTOSIS    =     3.605        4.827        5.835         7.519
SKEWNESS    =      .133        -.101        1.483        -2.021
MINIMUM     =  -481.855     -243.064         .926         5.817
MAXIMUM     =   460.616      261.425      482.015        15.022
-----EAST & NORTH-------- * * * * * * * * * * * * * * * * * * *
COVARIANCE   =    900.648   *
CORR. COEF.  =       .224   *
ORIENTATION  =     83.497   *
MAJAX        =     97.984   *
MINAX        =     39.966   *
ELLIP        =       .592   *
***************************************************************
```



AUTO SPECTRUM
6342A1H EAST
6342A1H NORTH
542 METERS
77-XI-16 TO 78-X-16
1 PIECES WITH 4000 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
6342A1H TEMPERATURE
542 METERS
77-XI-16 TO 78-X-16
1 PIECES WITH 4000 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

****

** 6343A900 ** 37908 POINTS FROM 77- XI -16 TO 78- XII-16

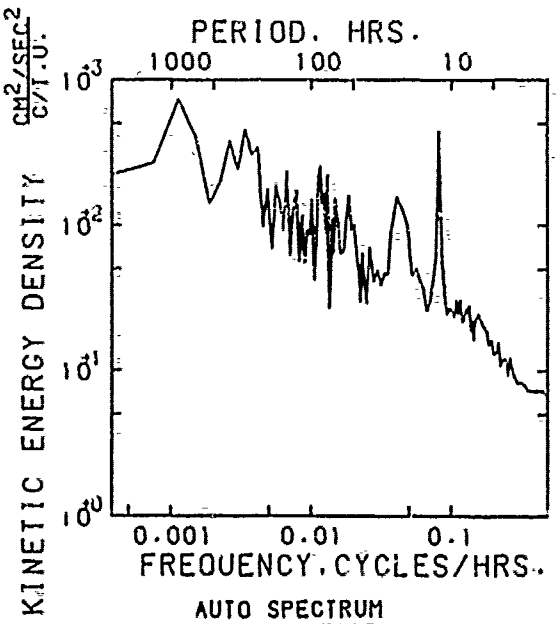
INST. V-0163 DEPTH 842 M. UNITS = MM/SEC , DEGREES CELSIUS

VARIABLE	EAST	NORTH	SPEED	TEMPERATURE
MEAN =	-1.023	-3.296	51.536	6.721
STD.ERR. =	.246	.168	.138	.400E-2
VARIANCE =	2292.087	1069.007	717.022	.606
KURTOSIS =	3.544	3.194	5.889	4.930
SKEWNESS =	-.914E-1	.127	1.401	.372
MINIMUM =	-247.625	-167.056	.535	4.596
MAXIMUM =	205.776	156.775	247.647	10.049

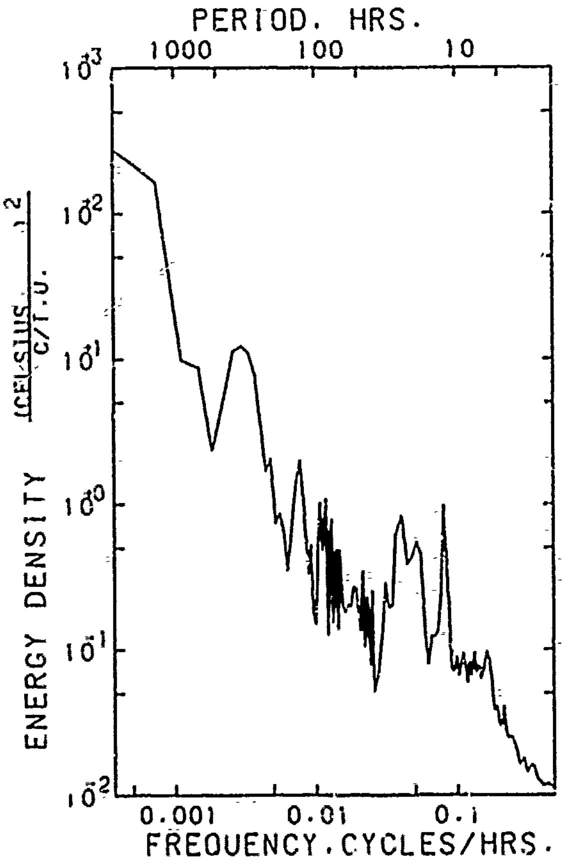
-----EAST & NORTH-------- * * * * * * * * * * * * * * * * * * *

EAST & NORTH	
COVARIANCE =	-178.164
CORR. COEF. =	-.114
ORIENTATION =	98.121
MAJAX =	48.141
MINAX =	32.305
ELLIP =	.329

****



AUTO SPECTRUM
6343A1H EAST
6343A1H NORTH
842 METERS
77-XI-16 TO 78-X-16
1 PIECES WITH 4000 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
6343A1H TEMPERATURE
842 METERS
77-XI-16 TO 78-X-16
1 PIECES WITH 4000 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

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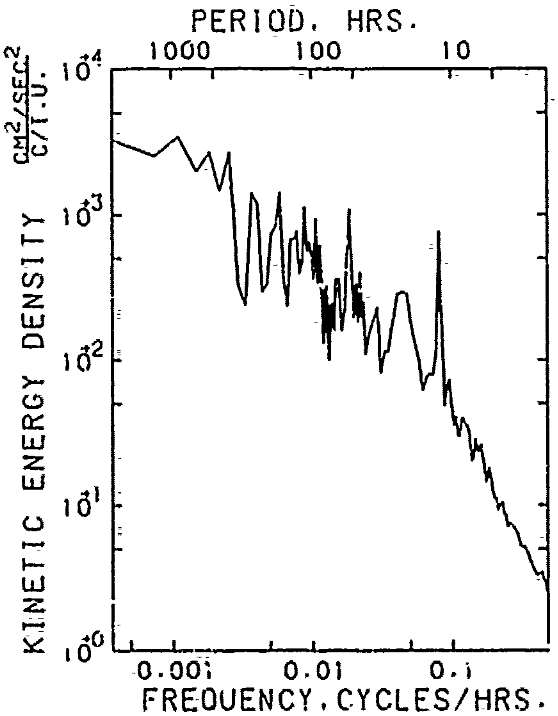
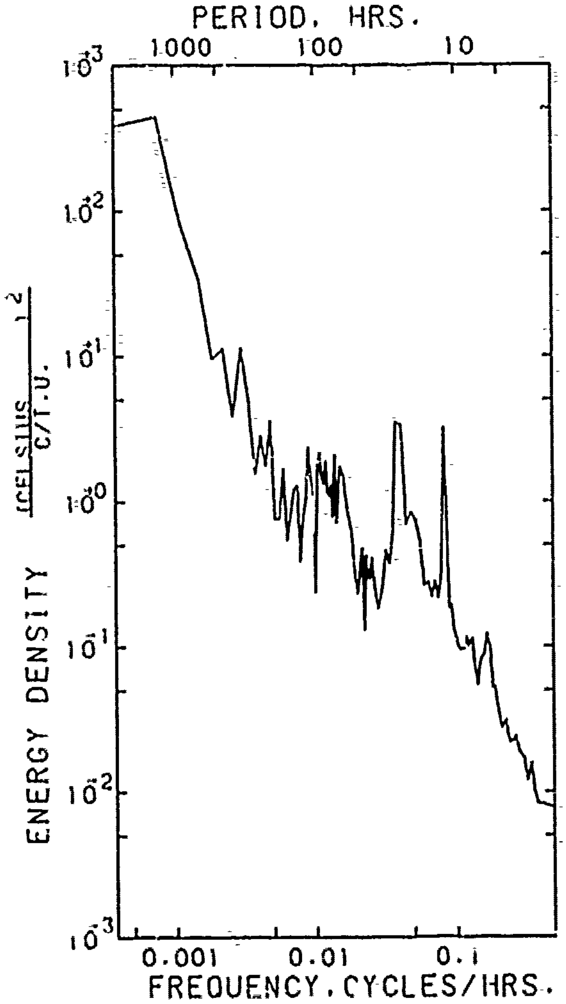
************************************************************************
** 6352A900      ** 37824 POINTS  FROM 77- XI -17  TO 78- XII-16
INST. V-0181   DEPTH  524 M.   UNITS = MM/SEC , DEGREES CELSIUS
VARIABLE ------- EAST ------ NORTH ----- SPEED ---- TEMPERATURE
MEAN      =      8.515        6.310        75.780        12.149
STD.ERR.  =       .288         .357          .248         .765E-2
VARIANCE  =   3144.290     4815.346      2329.388         2.214
KURTOSIS  =      5.197        3.429         6.948         5.822
SKEWNESS  =      -.261        -.219         1.631        -1.533
MINIMUM   =   -346.078     -301.932          .939         6.776
MAXIMUM   =    398.535      330.080       440.822        14.838
-----EAST & NORTH--------  * * * * * * * * * * * * * * * * * * *
COVARIANCE   =  2743.674   *
CORR. COEF.  =      .705   *
ORIENTATION  =    36.531   *
MAJAX        =    82.752   *
MINAX        =    33.343   *
ELLIP        =      .597   *
************************************************************************
```

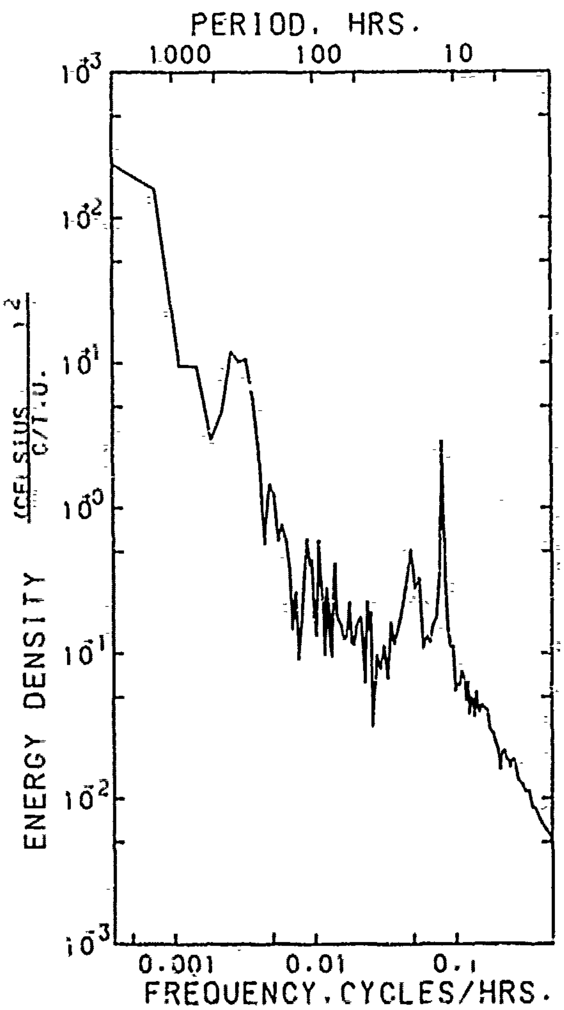


AUTO SPECTRUM
6352A1H EAST
6352A1H NORTH
524 METERS
77-XI-17 TO 78-X-17
1 PIECES WITH 4000 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

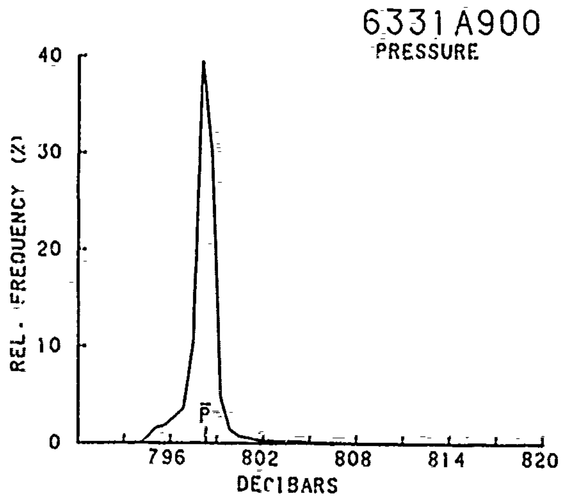


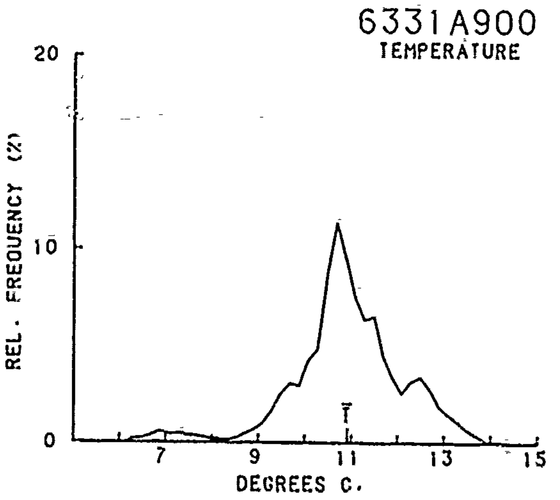
AUTO SPECTRUM
6352A1H TEMPERATURE
524 METERS
77-XI-17 TO 78-X-17
1 PIECES WITH 4000 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

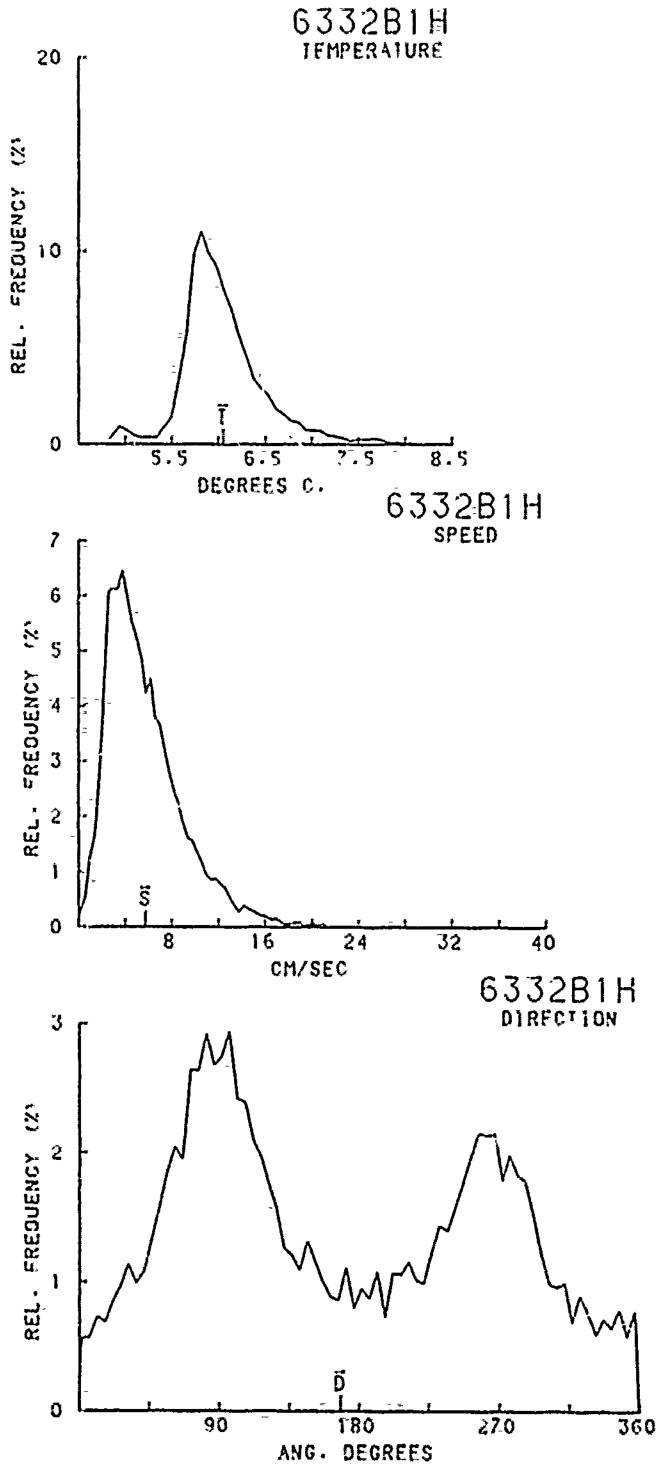
```
***********************************************************************
** 6353A900     ** 37824 POINTS  FROM 77- XI -17  TO 78- XII-16
INST. V-0371   DEPTH  824 M.   UNITS =  DEGREES CELSIUS
VARIABLE ---------------- TEMPERATURE ------------------------
MEAN         =              6.590
STD.ERR.     =               .361E-2
VARIANCE     =               .494
KURTOSIS     =              4.700
SKEWNESS     =               .545
MINIMUM      =              4.790
MAXIMUM      =              9.874
***********************************************************************
```

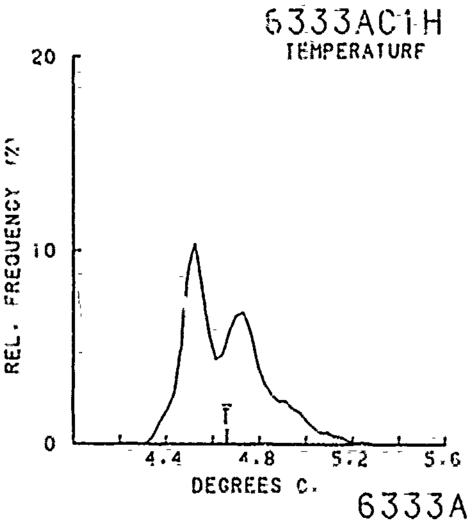


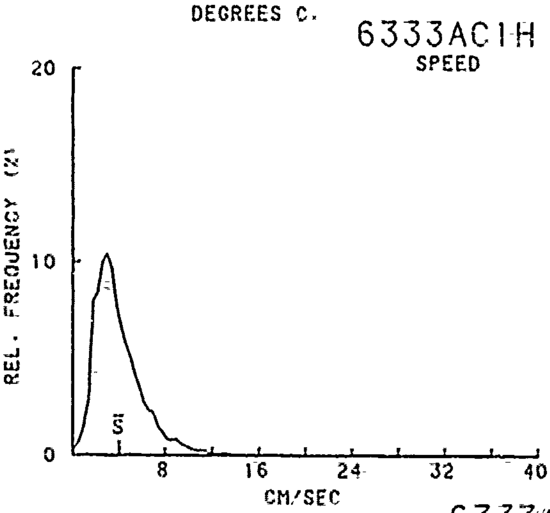
AUTO SPECTRUM
6353A1H TEMPERATURE
824 METERS
77-XI-17 TO 78-X-17
1 PIECES WITH 4000 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

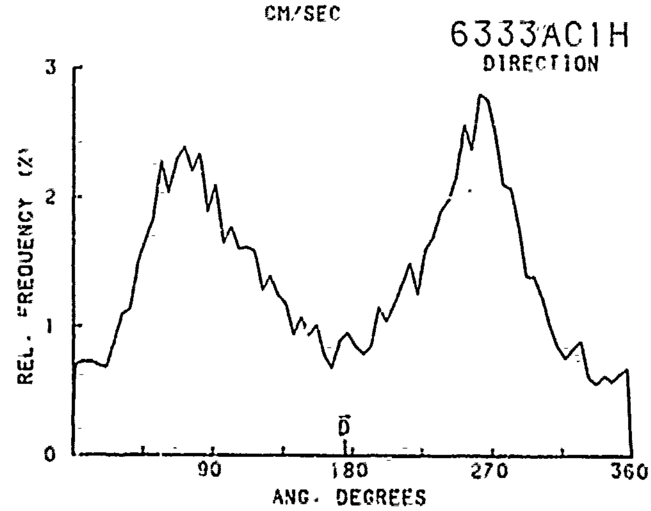

6331A900
PRESSURE
40
30
20
10
0
REL. FREQUENCY (%)
796
802
808
814
820
DECIBARS

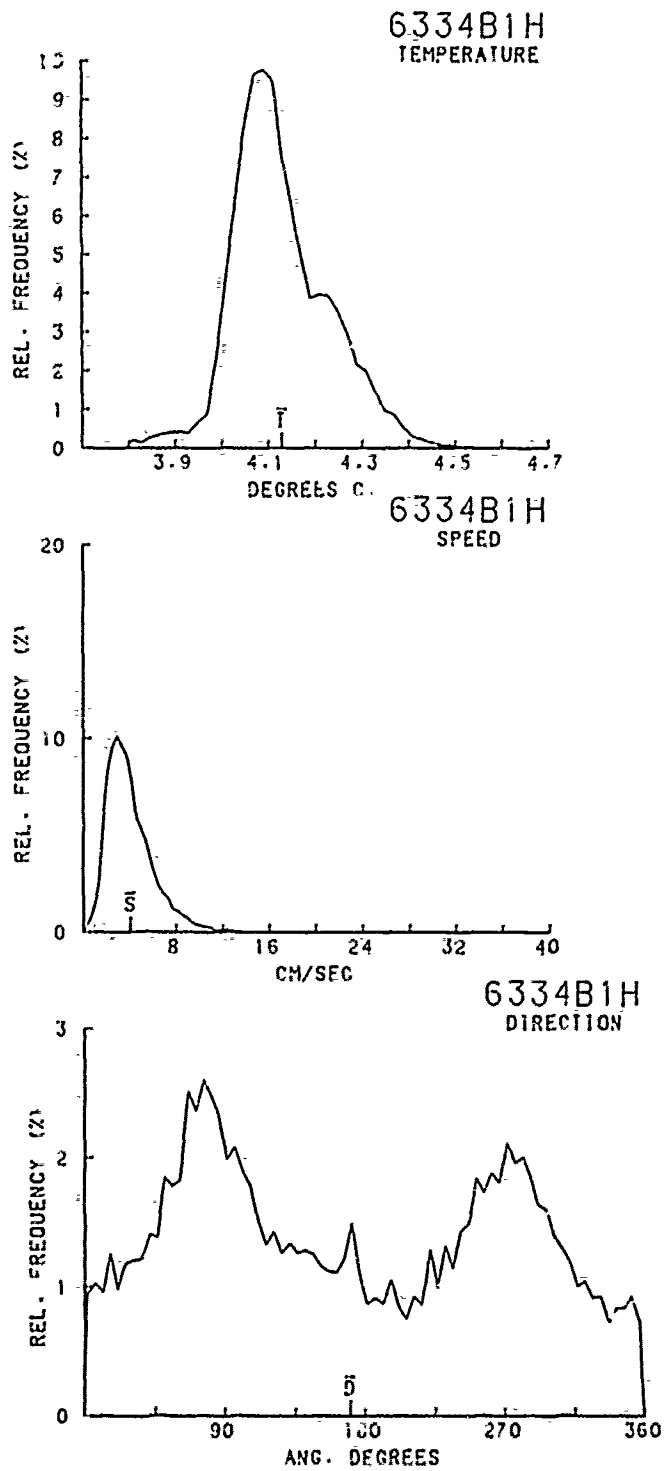

6331A900
TEMPERATURE
20
10
0
REL. FREQUENCY (%)
7
9
11
13
15
DEGREES C.

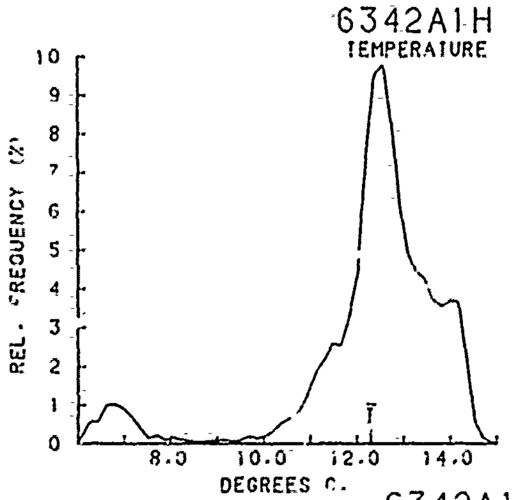

6332B1H
TEMPERATURE
REL. FREQUENCY (%)
20
10
0
5.5
6.5
7.5
8.5
DEGREES C.
6332B1H
SPEED
REL. FREQUENCY (%)
7
6
5
4
3
2
1
0
8
16
24
32
40
CM/SEC
6332B1H
DIRECTION
REL. FREQUENCY (%)
3
2
1
0
90
180
270
360
ANG. DEGREES

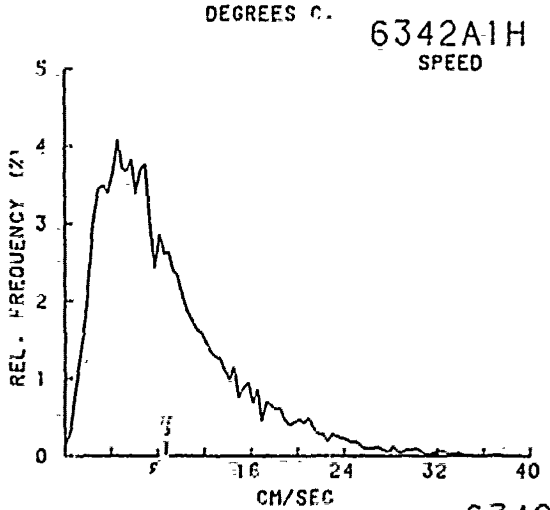

6333AC1H
TEMPERATURE
20
10
0
REL. FREQUENCY (%)
4.4
4.8
5.2
5.6
DEGREES C.

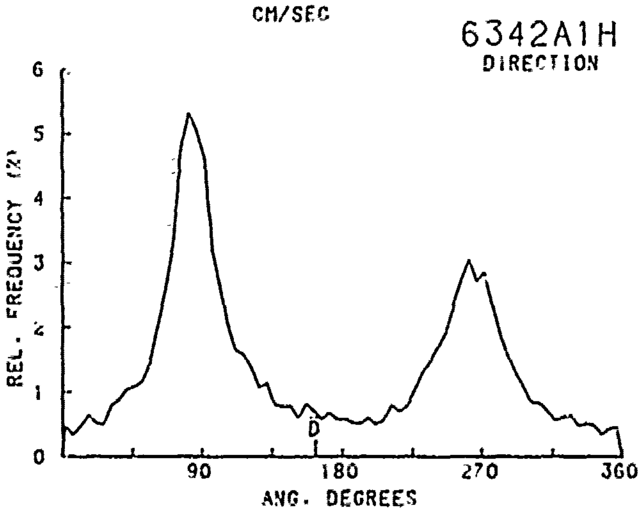

6333AC1H
SPEED
20
10
0
REL. FREQUENCY (%)
8
16
24
32
40
CM/SEC

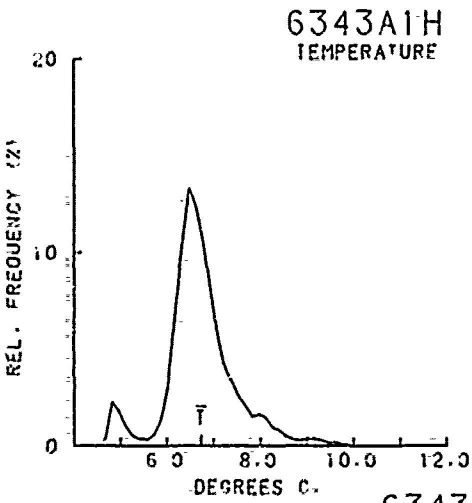

6333AC1H
DIRECTION
3
2
1
0
REL. FREQUENCY (%)
90
180
270
360
ANG. DEGREES

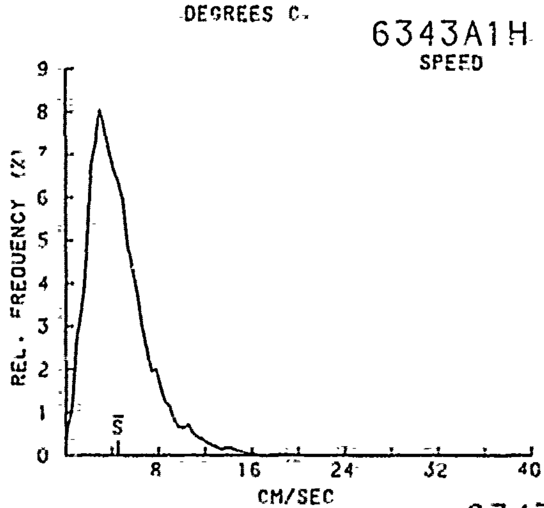

6334B1H
TEMPERATURE
REL. FREQUENCY (%)
3.9
4.1
4.3
4.5
4.7
DEGREES C.
6334B1H
SPEED
REL. FREQUENCY (%)
8
16
24
32
40
CM/SEC
6334B1H
DIRECTION
REL. FREQUENCY (%)
90
180
270
360
ANG. DEGREES

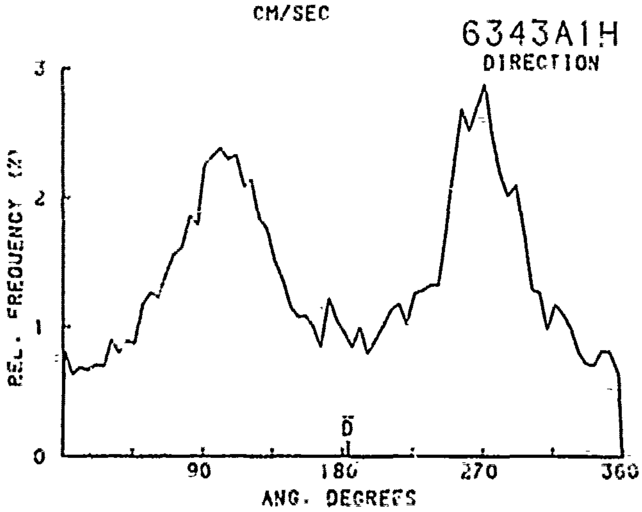

6342A1H
TEMPERATURE
REL. FREQUENCY (%)
10
9
8
7
6
5
4
3
2
1
0
8.0
10.0
12.0
14.0
DEGREES C.

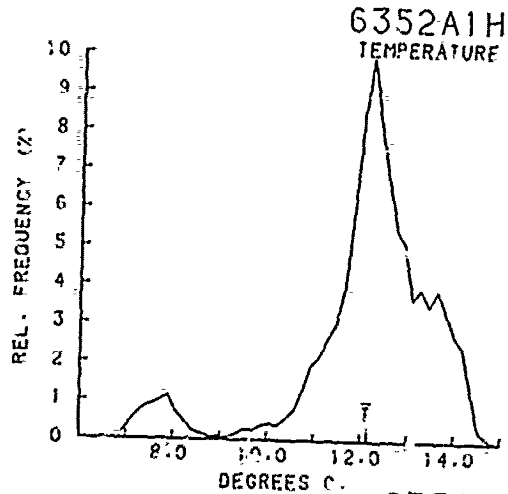

6342A1H
SPEED
REL. FREQUENCY (%)
5
4
3
2
1
0
16
24
32
40
CM/SEC

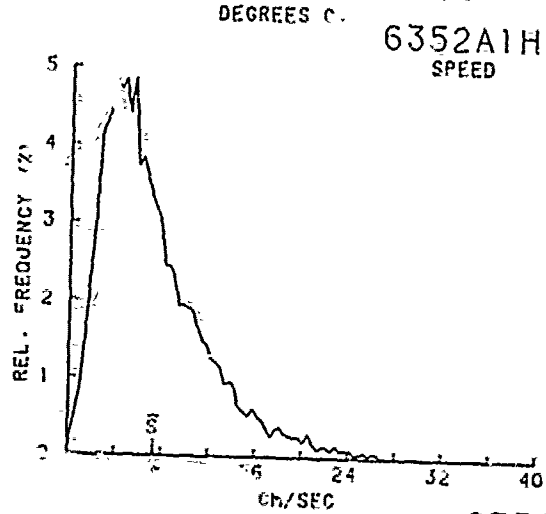

6342A1H
DIRECTION
REL. FREQUENCY (%)
6
5
4
3
2
1
0
90
180
270
360
ANG. DEGREES

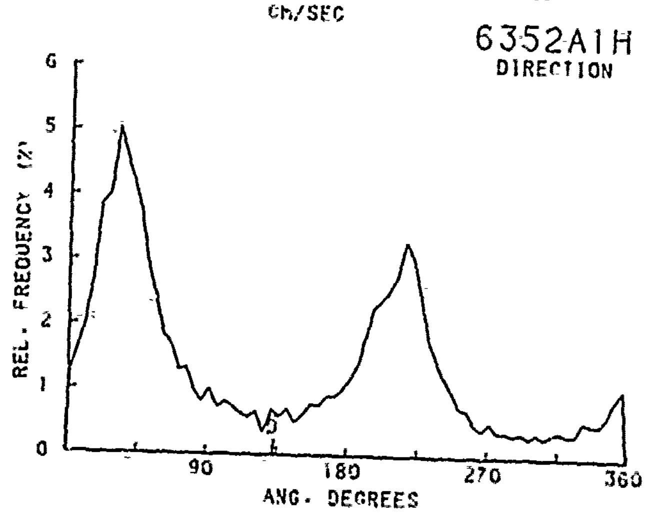

6343A1H
TEMPERATURE
REL. FREQUENCY (%)
20
10
0
6.0
8.0
10.0
12.0
DEGREES C.

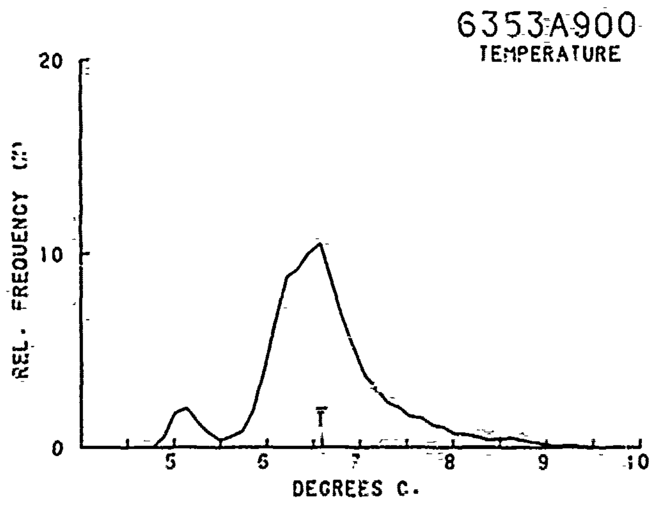

6343A1H
SPEED
REL. FREQUENCY (%)
9
8
7
6
5
4
3
2
1
0
8
16
24
32
40
CM/SEC


6343A1H
DIRECTION
REL. FREQUENCY (%)
3
2
1
0
90
180
270
360
ANG. DEGREES

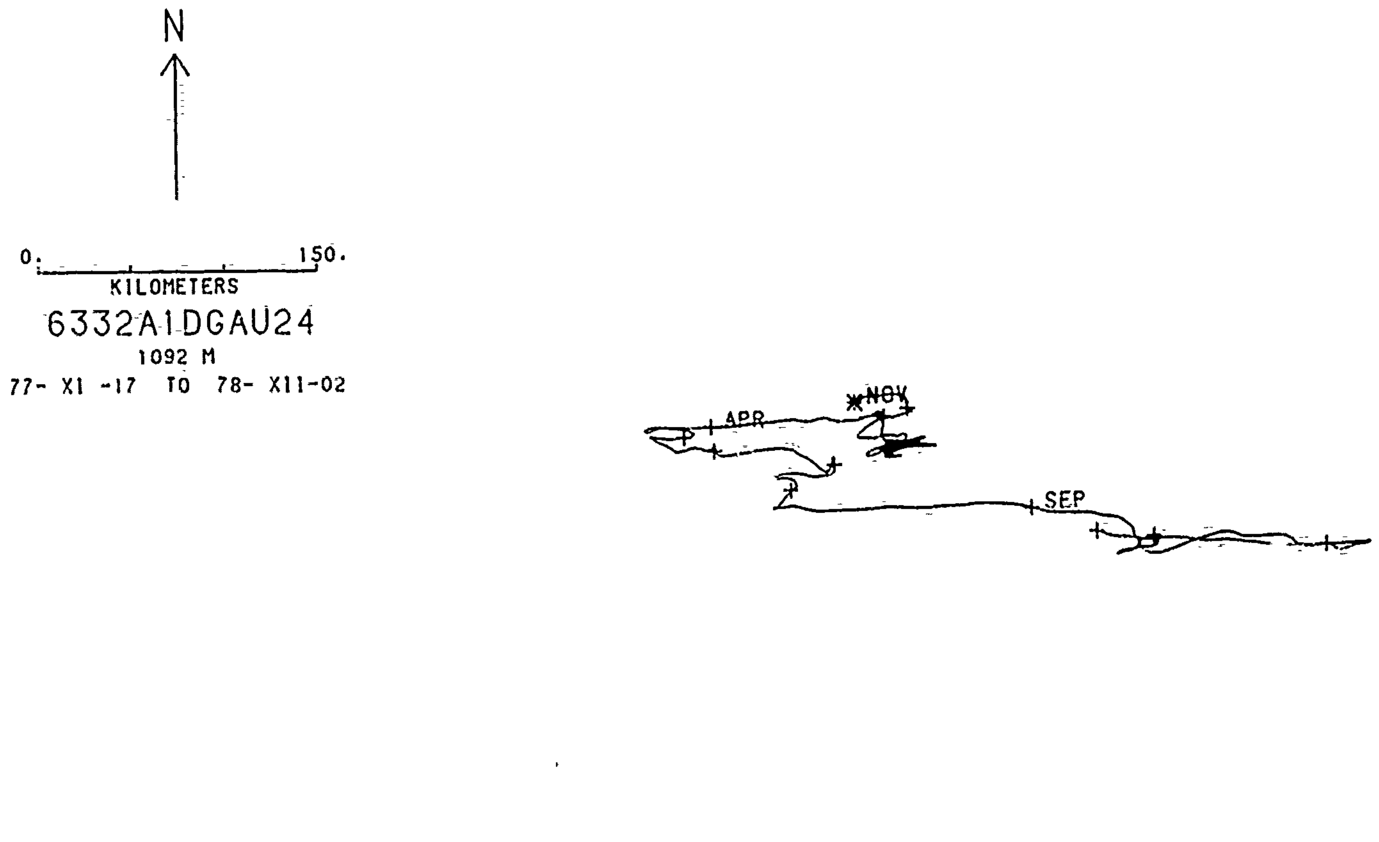

6352A1H
TEMPERATURE
REL. FREQUENCY (%)
DEGREES C.

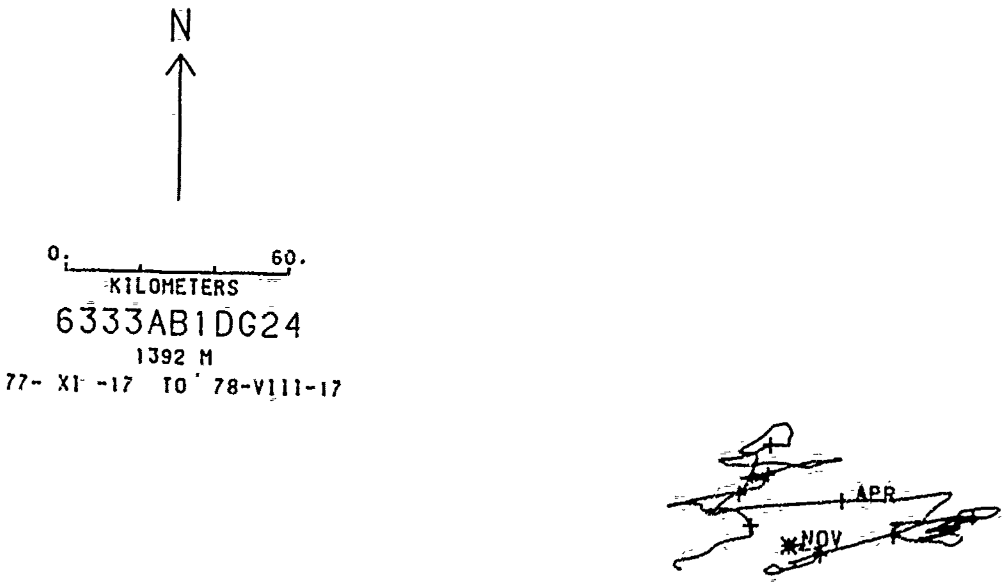

6352A1H
SPEED
REL. FREQUENCY (%)
CM/SEC


6352A1H
DIRECTION
REL. FREQUENCY (%)
ANG. DEGREES



6353A900
TEMPERATURE
20
10
0
REL. FREQUENCY (%)
T̄
5
6
7
8
9
10
DEGREES C.


N
0.
150.
KILOMETERS
6332A1DGAU24
1092 M
77- XI -17 TO 78- XII-02
APR
NOV
SEP


N
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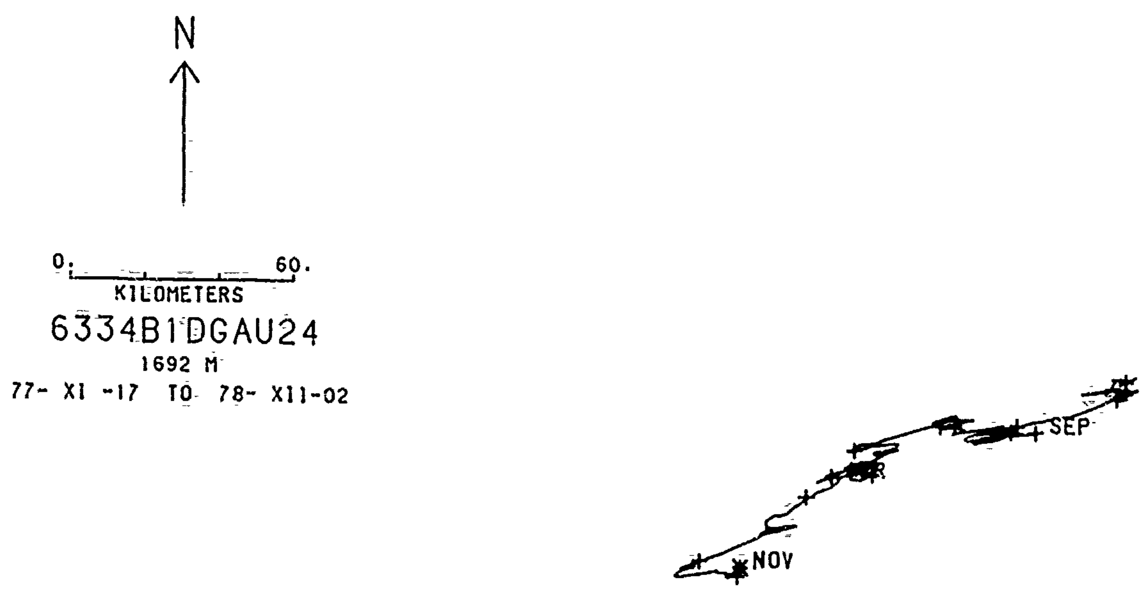
60.
KILOMETERS
6333AB1DG24
1392 M
77- XI -17 TO 78-VIII-17
APR
NOV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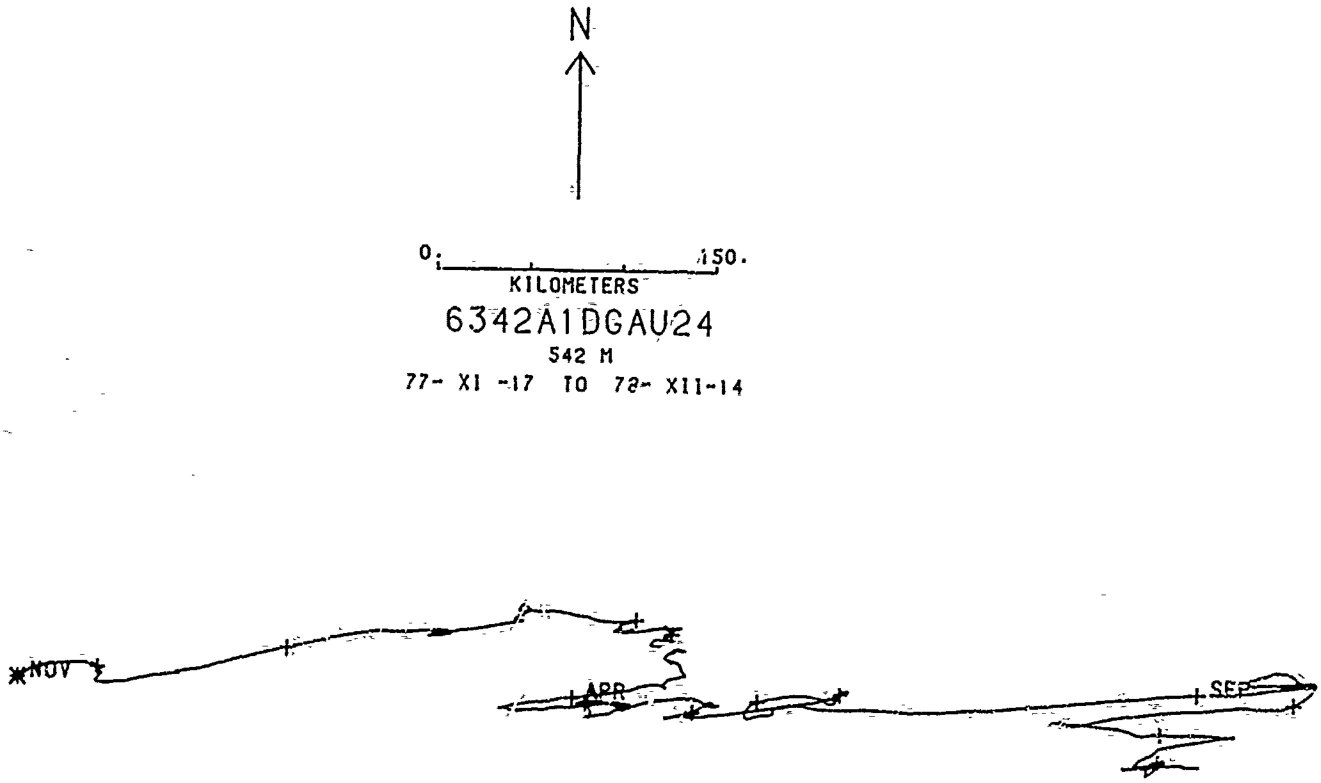
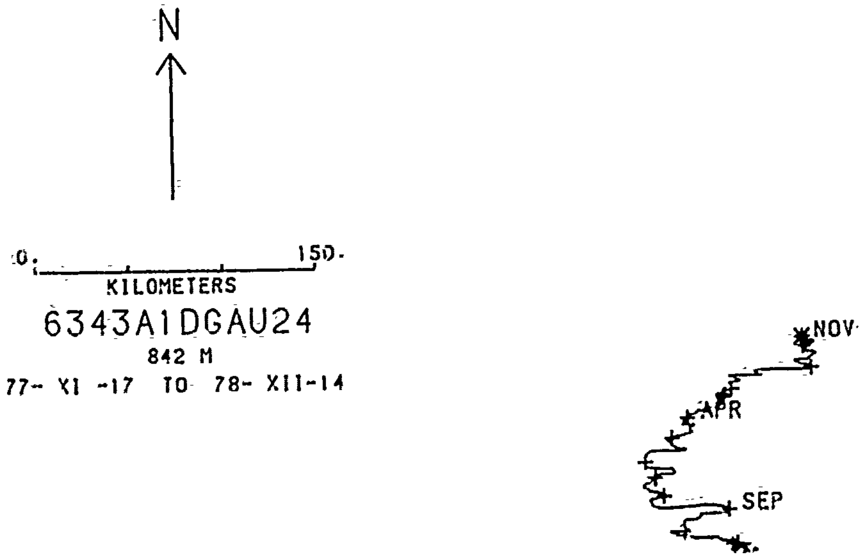
KILOMETERS
6334B1DGAU24
1692 M
77- XI -17 TO 78- XII-02
SEP
NOV


N
0
150.
KILOMETERS
6342A1DGAU24
542 M
77- XI -17 TO 78- XII-14
NOV
APR
SEP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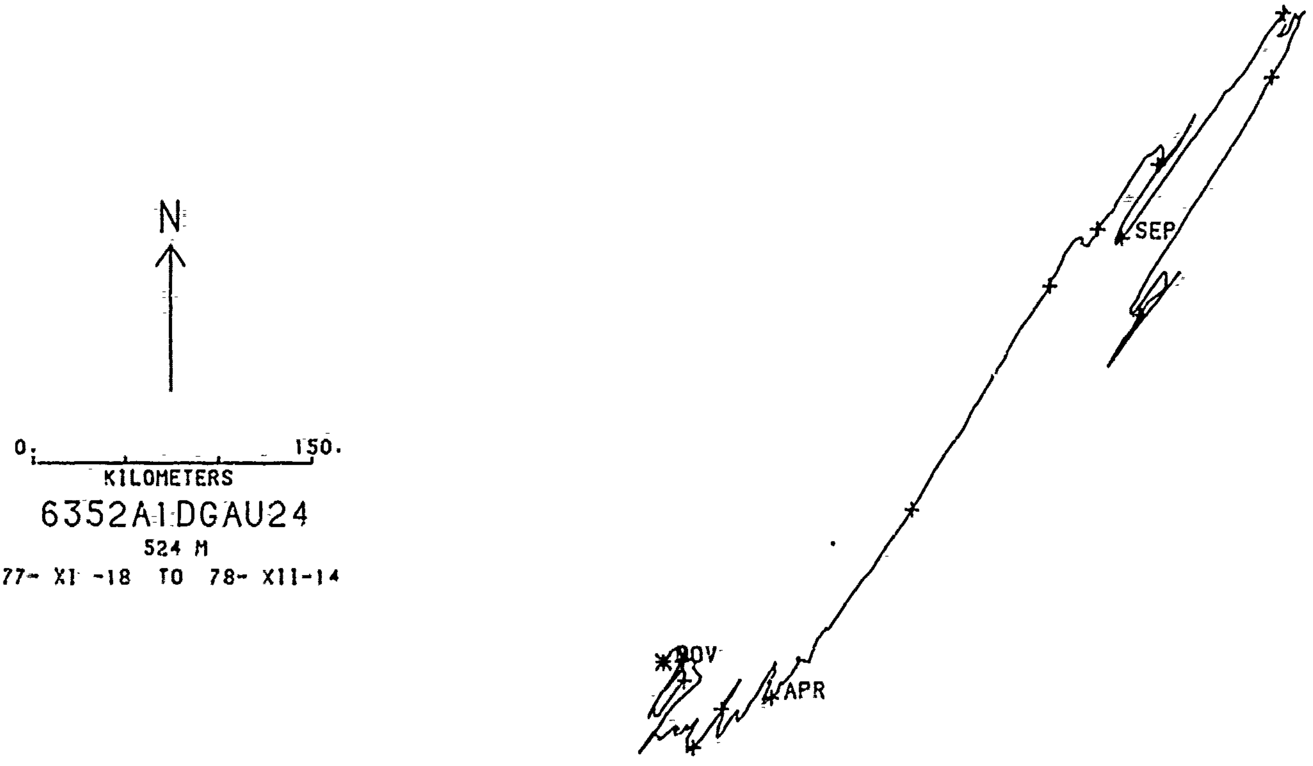
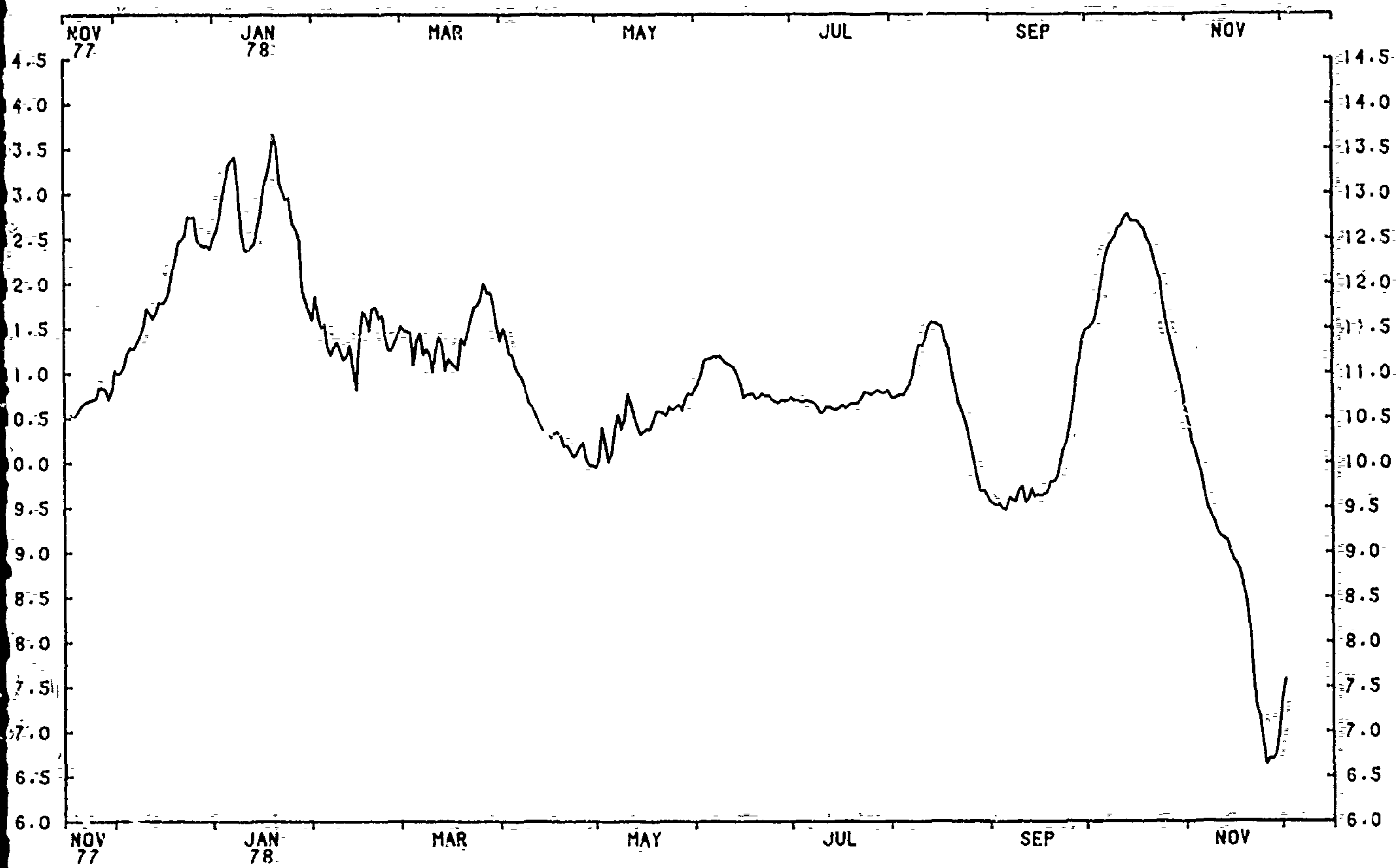
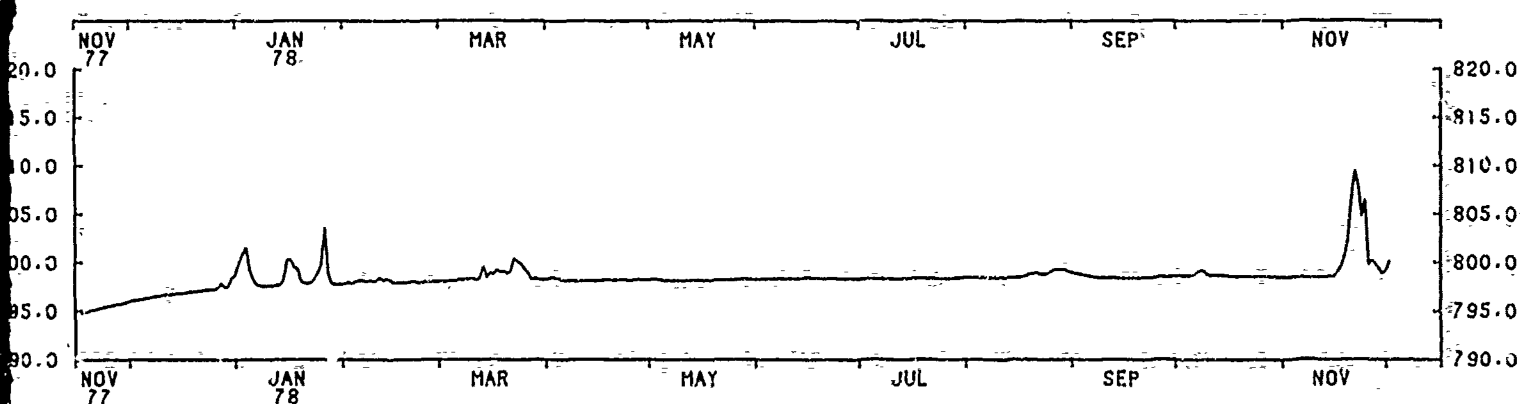
0.
150.
KILOMETERS
6343A1DGAU24
842 M
77- XI -17 TO 78- XII-14
NOV
APR
SEP

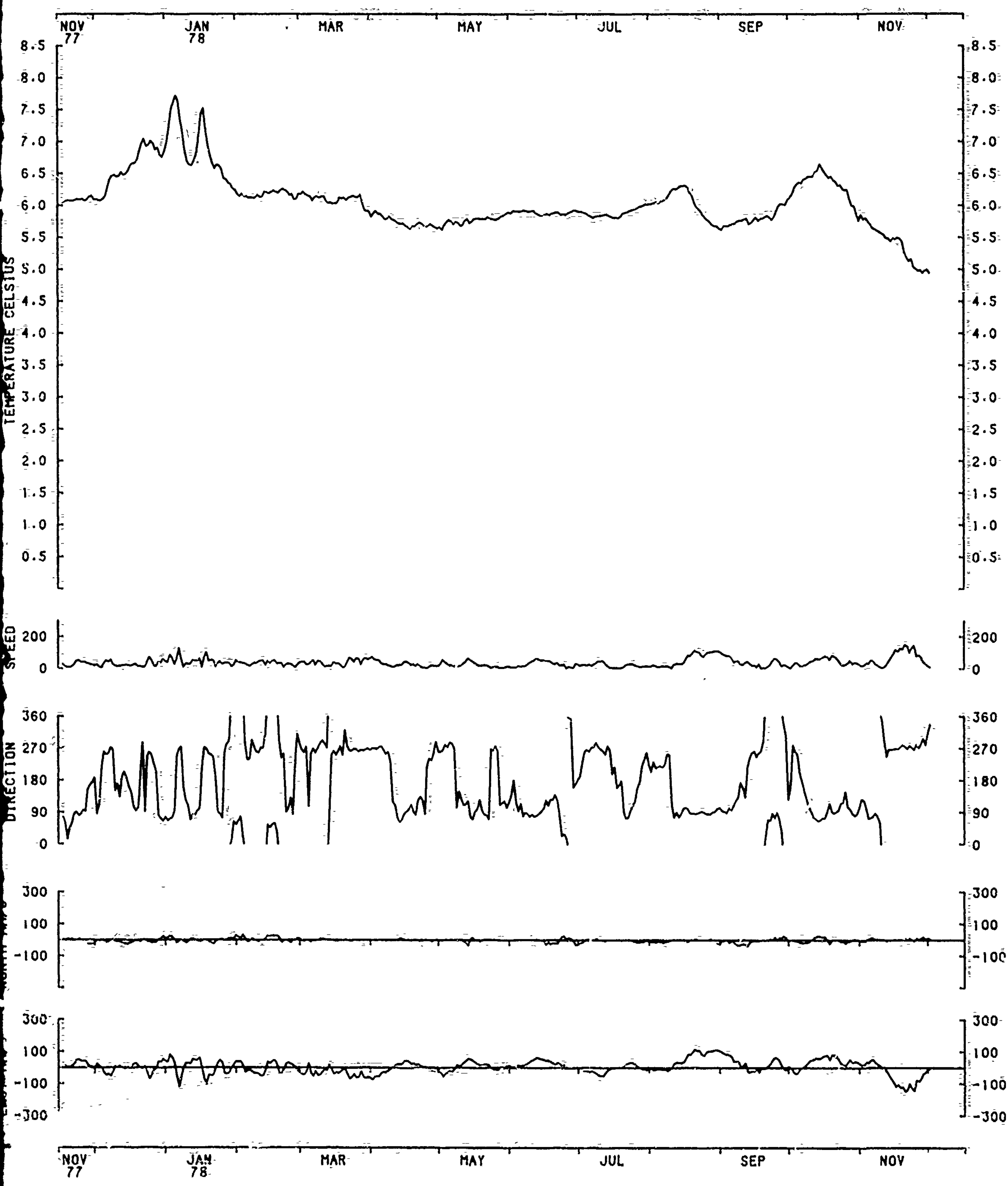

N
0.
150.
KILOMETERS
6352A1DGAU24
524 M
77- XI -18 TO 78- XII-14
NOV
APR
SEP



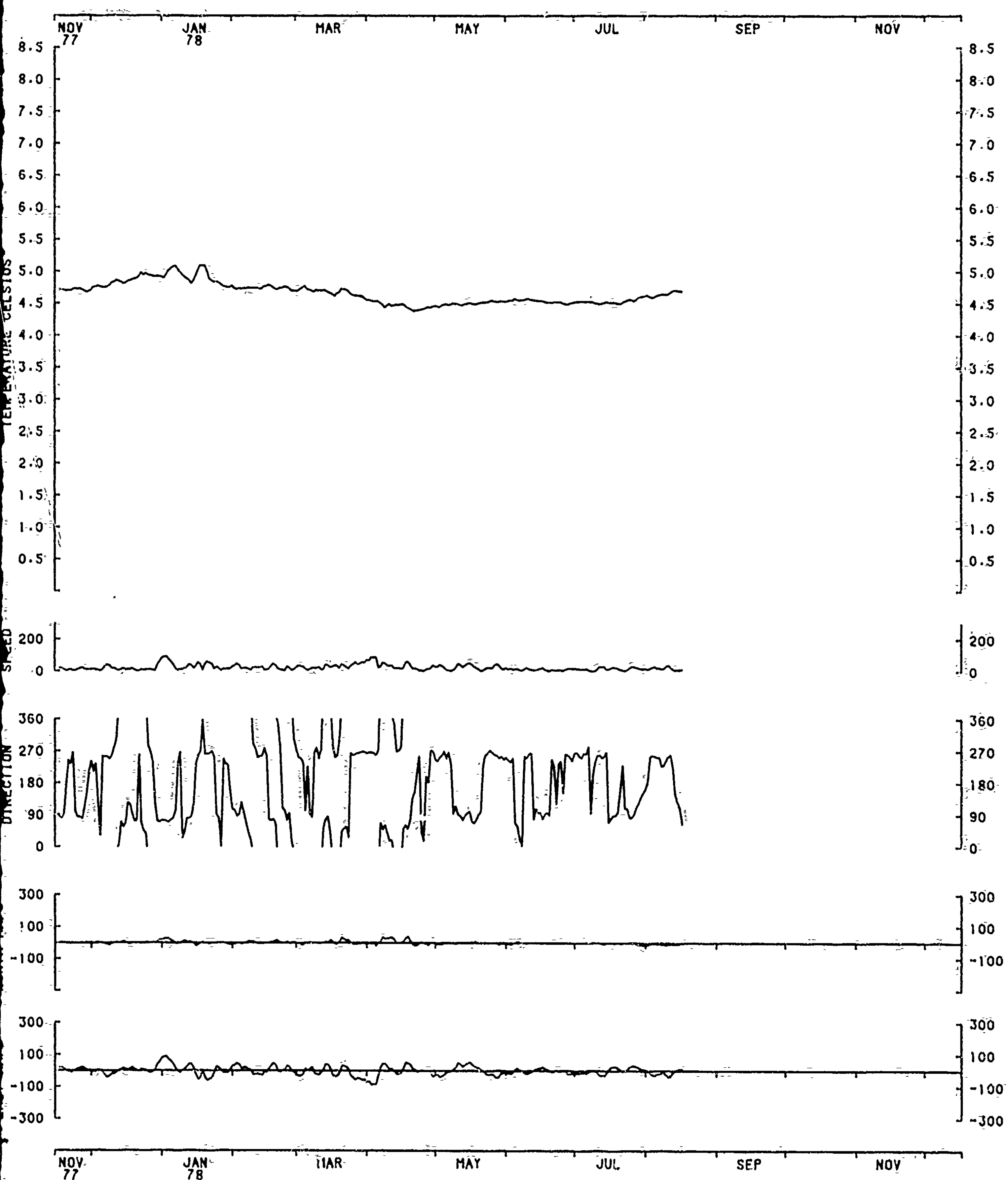
RECORD #6331A1DGAU24 DEPTH=792 METERS



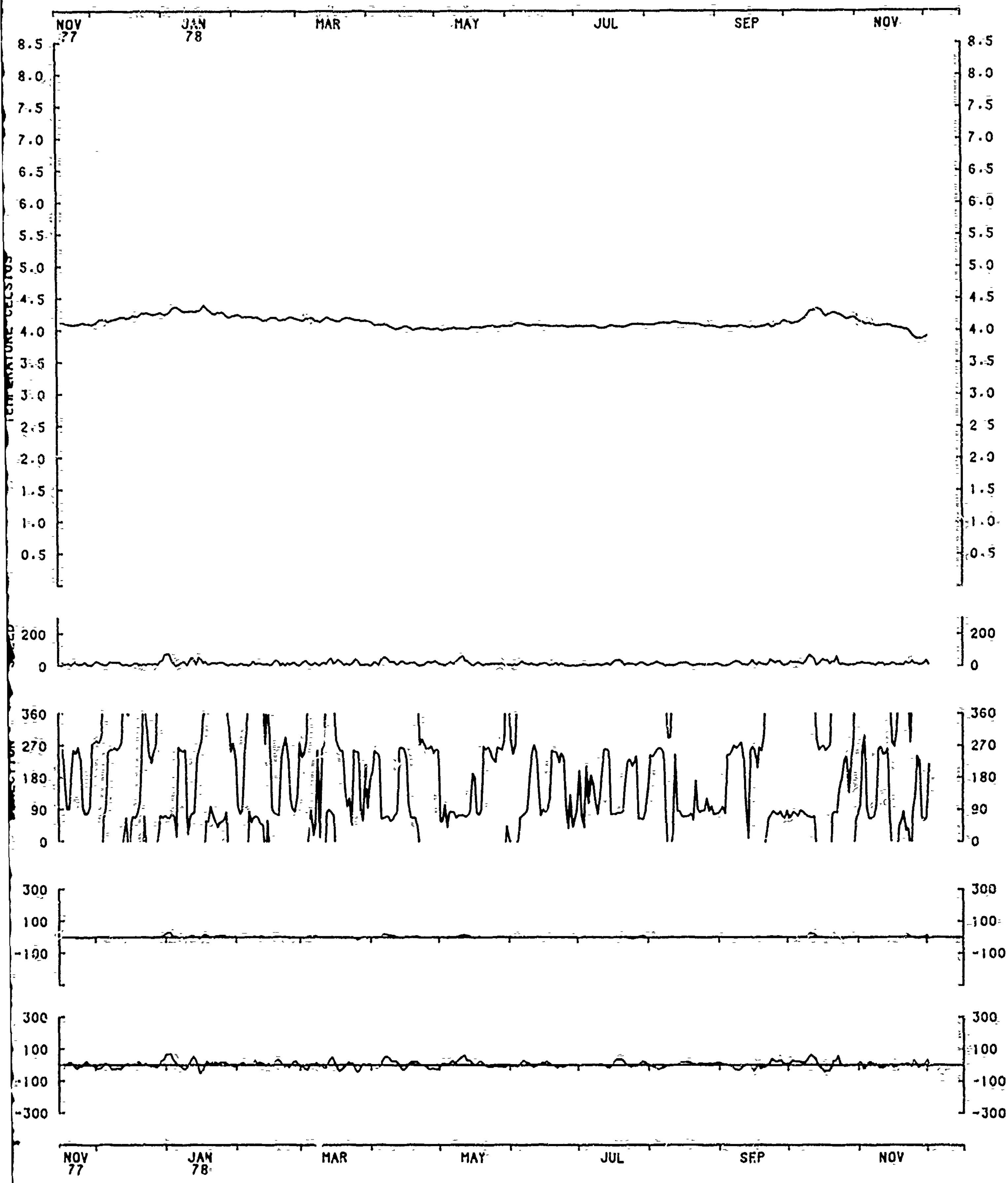
RECORD #6331A1DGAU24 DEPTH=792 METERS



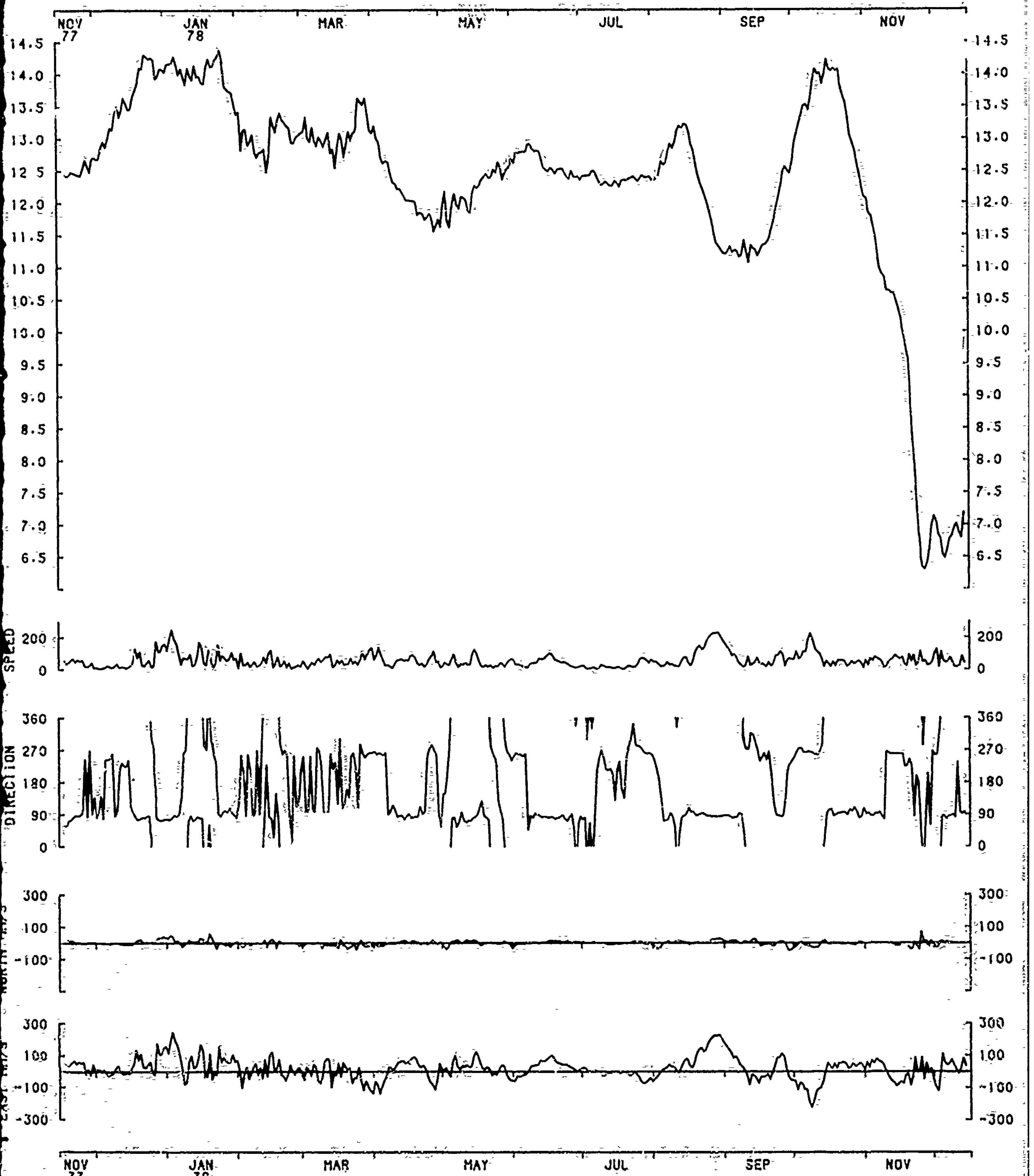
RECORD #6332A1DGAU24 DEPTH=1092 METERS



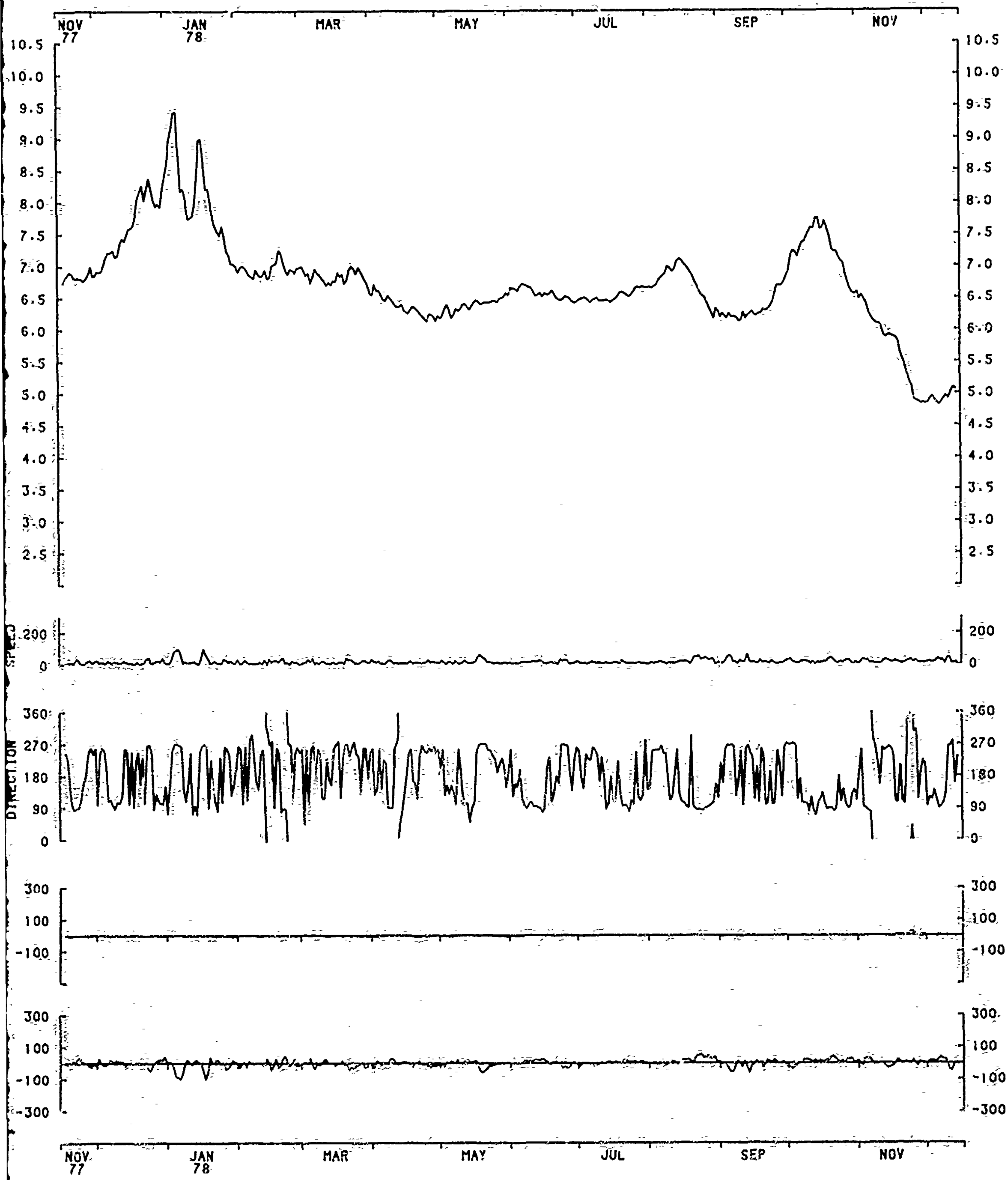
RECORD #6333AB1DG24   DEPTH=1392 METERS



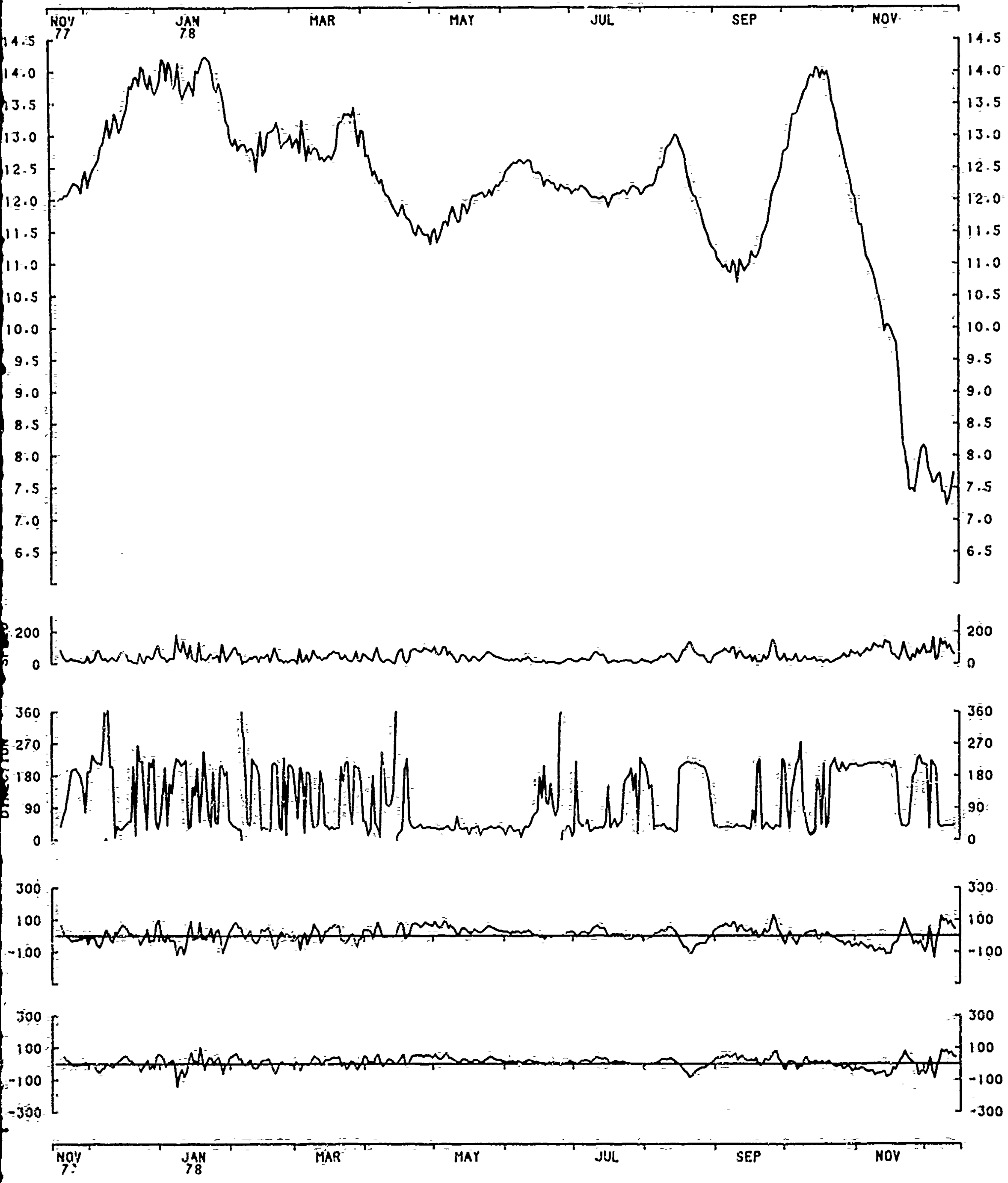
RECORD #6334B1DGAU24 DEPTH=1692 METERS



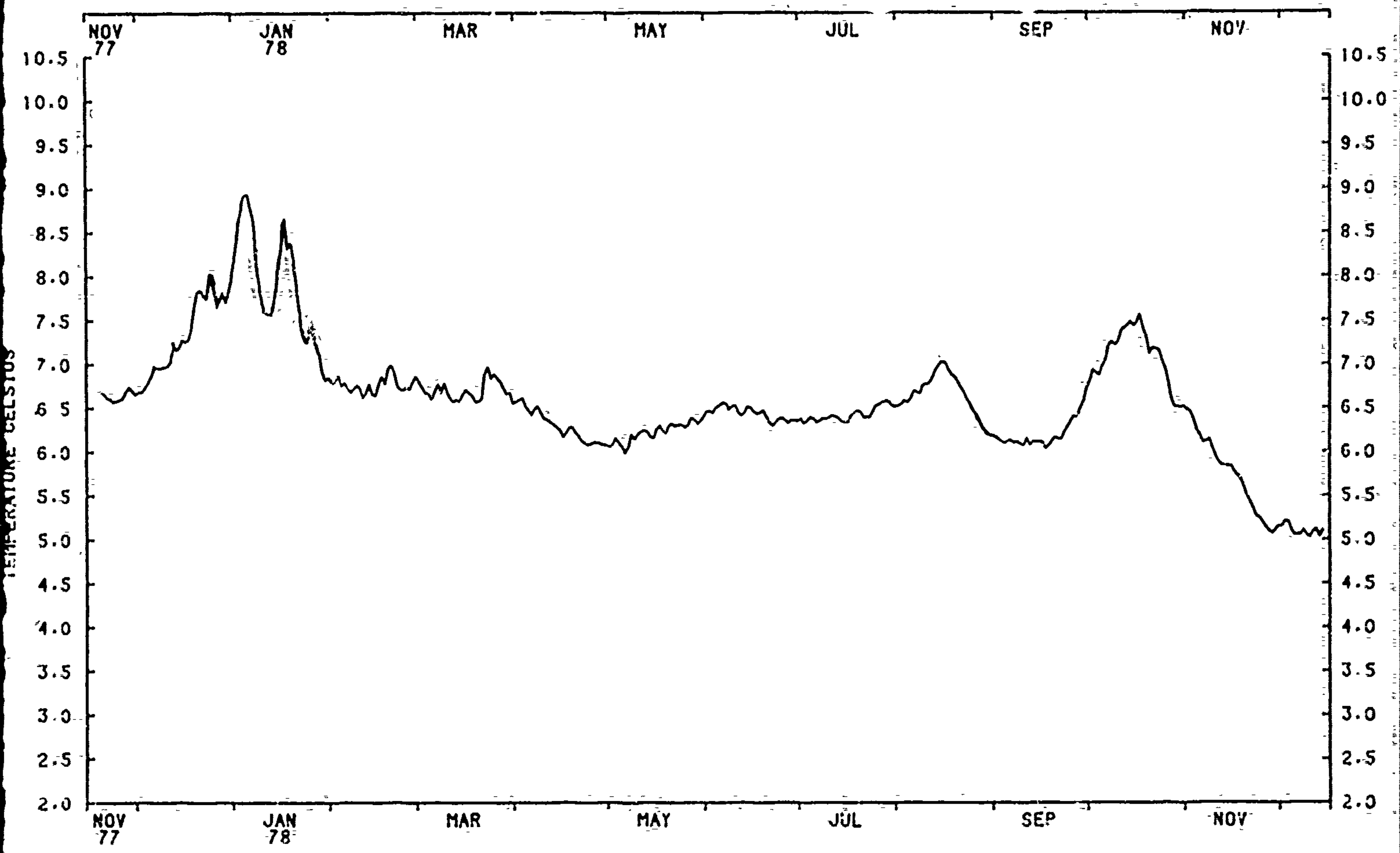
RECORD #6342A1DGAU24 DEPTH=542 METERS



RECORD #6343A1DGAU24 DEPTH=842 METERS



RECORD #6352A1DGAU24 DEPTH=524 METERS



RECORD #6353A1DGAU24 DEPTH=824 METERS

```
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666666666666   333333333333    333333333333        111
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66                       33              33         11
66                       33              33         11
66666666666          3333            3333           11
666666666666         3333            3333           11
66        66             33              33         11
66        66             33              33         11
66        66             33              33         11
666666666666   333333333333    333333333333         11
 6666666666     3333333333      3333333333          11




                                IIIIIIII                    SSSSSSSSSS
                                IIIIIIII                   SSSSSSSSSSSS
                                   II                      SS        SS
                                   II                      SS
                                   II                      SS
                                   II                      SSSSSSSSSSS
                                   II                       SSSSSSSSSSS
                                   II                                SS
                                   II                                SS
                                   II                      SS        SS
                                IIIIIIII                   SSSSSSSSSSSS
                                IIIIIIII                    SSSSSSSSSS
```

```
 6666666666    3333333333    3333333333    2222222222
666666666666  333333333333  333333333333  222222222222
66            33        33  33        33  22        22
66                      33            33            22
66                      33            33            22
66666666666           3333          3333           22
666666666666          3333          3333          22
66        66            33            33         22
66        66            33            33       22
66        66            33            33     22
666666666666  333333333333  333333333333  222222222222
 6666666666    3333333333    3333333333   222222222222


LL                       AAAAAAAAAA              NN        NN
LL                      AAAAAAAAAAAA             NNN       NN
LL                      AA        AA             NNNN      NN
LL                      AA        AA             NN NN     NN
LL                      AA        AA             NN  NN    NN
LL                      AAAAAAAAAAAA             NN   NN   NN
LL                      AAAAAAAAAAAA             NN    NN  NN
LL                      AA        AA             NN     NN NN
LL                      AA        AA             NN      NN NN
LL        LL            AA        AA             NN       NNNN
LLLLLLLLLLLL            AA        AA             NN        NNN
LLLLLLLLLLLL            AA        AA             NN         NN
```

```
 66666666666    3333333333     3333333333     3333333333
666666666666   333333333333   333333333333   333333333333
66             33        33   33        33   33        33
66                       33             33             33
66                       33             33             33
66666666666            3333           3333           3333
666666666666           3333           3333           3333
66        66             33             33             33
66        66             33             33             33
66        66             33             33             33
666666666666   333333333333   333333333333   333333333333
 6666666666     3333333333     3333333333     3333333333
```

```
DDDDDDDDDDD                                  TTTTTTTTTTTT
DDDDDDDDDDDD                                 TTTTTTTTTTTT
DD        DD                                      TT
DD        DD                                      TT
DD        DD                                      TT
DD        DD                                      TT
DD        DD                                      TT
DD        DD                                      TT
DD        DD                                      TT
DD        DD                                      TT
DDDDDDDDDDDD                                      TT
DDDDDDDDDDD                                       TT
```

```
 6666666666      3333333333      3333333333           44
666666666666    333333333333    333333333333         444
66              33        33    33        33        4444
66                        33              33       44 44
66                        33              33      44  44
66666666666            3333            3333      44   44
666666666666           3333            3333     44    44
66        66              33              33    444444444444
66        66              33              33    444444444444
66        66              33              33          44
666666666666    333333333333    333333333333          44
 6666666666      3333333333      3333333333           44
```

```
RRRRRRRRRRR                  AAAAAAAAAA                  PPPPPPPPPPP
RRRRRRRRRRRR                AAAAAAAAAAAA                 PPPPPPPPPPPP
RR        RR                AA        AA                 PP        PP
RR        RR                AA        AA                 PP        PP
RR        RR                AA        AA                 PP        PP
RRRRRRRRRRRR                AAAAAAAAAAAA                 PPPPPPPPPPPP
RRRRRRRRRRR                 AAAAAAAAAAAA                 PPPPPPPPPPP
RR    RR                    AA        AA                 PP
RR     RR                   AA        AA                 PP
RR      RR                  AA        AA                 PP
RR       RR                 AA        AA                 PP
RR        RR                AA        AA                 PP
```

```
 66666666666      33333333333            44        22222222222
6666666666666    3333333333333          444       2222222222222
66               33         33         4444       22         22
66                          33        44 44                  22
66                          33       44  44                  22
66666666666               3333      44   44                 22
6666666666666             3333     44    44               22
66         66               33    444444444444          22
66         66               33    444444444444        22
66         66               33           44         22
6666666666666    3333333333333           44       2222222222222
 66666666666      33333333333            44       2222222222222


PPPPPPPPPPPP                 EEEEEEEEEEEEE                DDDDDDDDDDD
PPPPPPPPPPPPP                EEEEEEEEEEEEE                DDDDDDDDDDDDD
PP         PP                EE                           DD         DD
PP         PP                EE                           DD         DD
PP         PP                EE                           DD         DD
PPPPPPPPPPPPP                EEEEEEEE                     DD         DD
PPPPPPPPPPPP                 EEEEEEEE                     DD         DD
PP                           EE                           DD         DD
PP                           EE                           DD         DD
PP                           EE                           DD         DD
PP                           EEEEEEEEEEEEE                DDDDDDDDDDDDD
PP                           EEEEEEEEEEEEE                DDDDDDDDDDD


 66666666666      33333333333            44            11
6666666666666    3333333333333          444           111
66               33         33         4444          1111
66                          33        44 44            11
66                          33       44  44            11
66666666666               3333      44   44            11
6666666666666             3333     44    44            11
66         66               33    444444444444         11
66         66               33    444444444444         11
66         66               33           44            11
6666666666666    3333333333333           44            11
 66666666666      33333333333            44            11
```

```
 6666666666     3333333333           44          3333333333
666666666666    333333333333         444         333333333333
66              33        33        4444         33        33
66                        33       44 44                   33
66                        33      44  44                   33
66666666666            3333      44   44              3333
666666666666           3333     44    44              3333
66        66              33    444444444444              33
66        66              33    444444444444              33
66        66              33           44                 33
666666666666    333333333333           44        333333333333
 6666666666      3333333333            44         3333333333
```

```
WW        WW     AAAAAAAAAA
WW        WW    AAAAAAAAAAAA
WW        WW    AA        AA
WW        WW    AA        AA
WW        WW    AA        AA
WW        WW    AAAAAAAAAAAA
WW   WWW  WW    AAAAAAAAAAAA
WW  WW WW WW    AA        AA
WW WW  WW WW    AA        AA
WWWW    WWWW    AA        AA
WWW      WWW    AA        AA
WW        WW    AA        AA
```

```
 66666666666     33333333333     5555555555555     22222222222
6666666666666   3333333333333    5555555555555    2222222222222
66              33         33    55               22         22
66                         33    55                          22
66                         33    55                          22
666666666666             3333    555555555555               22
6666666666666            3333    5555555555555             22
66         66              33               55           22
66         66              33               55         22
66         66              33    55         55       22
6666666666666   3333333333333    5555555555555    2222222222222
 66666666666     33333333333      55555555555     2222222222222



VV        VV                EEEEEEEEEEEEE                SSSSSSSSSSS
VV        VV                EEEEEEEEEEEEE               SSSSSSSSSSSSS
 VV      VV                 EE                          SS         SS
 VV      VV                 EE                          SS
  VV    VV                  EE                          SS
  VV    VV                  EEEEEEEE                    SSSSSSSSSSSS
   VV  VV                   EEEEEEEE                     SSSSSSSSSSSS
   VV  VV                   EE                                     SS
    VV VV                   EE                                     SS
    VV VV                   EE                          SS         SS
     VV                     EEEEEEEEEEEEE               SSSSSSSSSSSSS
     V                      EEEEEEEEEEEEE                SSSSSSSSSSS

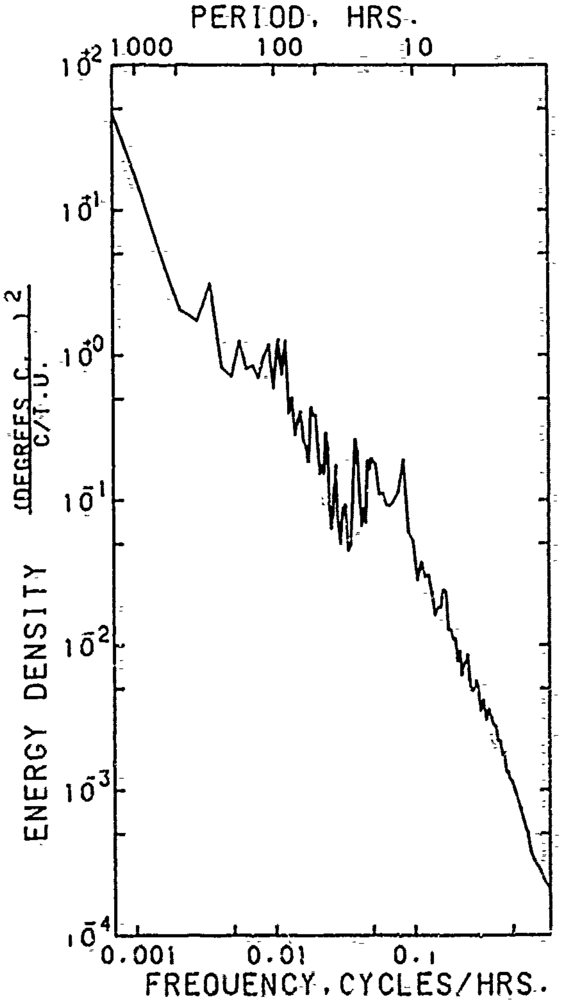


 66666666666     33333333333     5555555555555        11
6666666666666   3333333333333    5555555555555       111
66              33         33    55                 1111
66                         33    55                   11
66                         33    55                   11
666666666666             3333    555555555555         11
6666666666666            3333    5555555555555        11
66         66              33               55        11
66         66              33               55        11
66         66              33    55         55        11
6666666666666   3333333333333    5555555555555        11
 66666666666     33333333333      55555555555         11
```

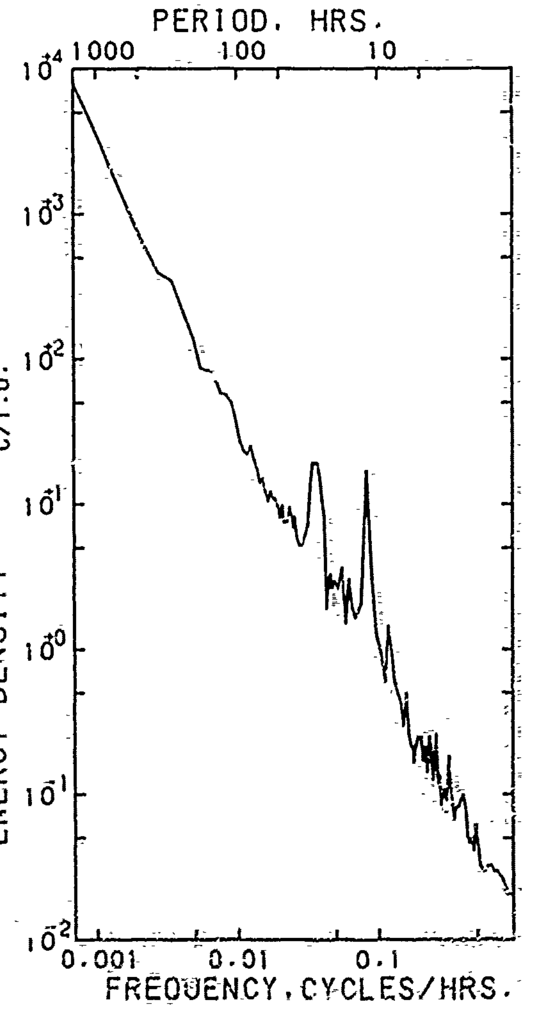
```
 66666666666     33333333333    5555555555555     33333333333
6666666666666   3333333333333   5555555555555    3333333333333
66              33         33   55               33         33
66                         33   55                          33
66                         33   55                          33
666666666666             3333   555555555555              3333
6666666666666            3333   5555555555555             3333
66         66              33              55               33
66         66              33              55               33
66         66              33   55         55               33
6666666666666   3333333333333   5555555555555    3333333333333
 66666666666     33333333333     55555555555      33333333333
```

DATA/ 6341$1920

******				
VARIABLE	*	TEMPERATURE	PRESSURE	
UNITS	*	DEGREES C.	DBARS	
******				
MEAN	=	17.229	410.792	* SAMPLE SIZE = 17690 POINTS
STD. ERR.	=	.923E-2	.200	*
VARIANCE	=	1.506	707.892	* SPANNING RANGE
STD. DEV.	=	1.227	26.606	* FROM 77- XI -18 17.24.00
KURTOSIS	=	12.771	13.037	* TO 78- XII-16 19.32.00
SKEWNESS	=	-3.236	3.200	*
MINIMUM	=	11.987	386.369	* DURATION 393.09 DAYS
MAXIMUM	=	18.321	551.941	



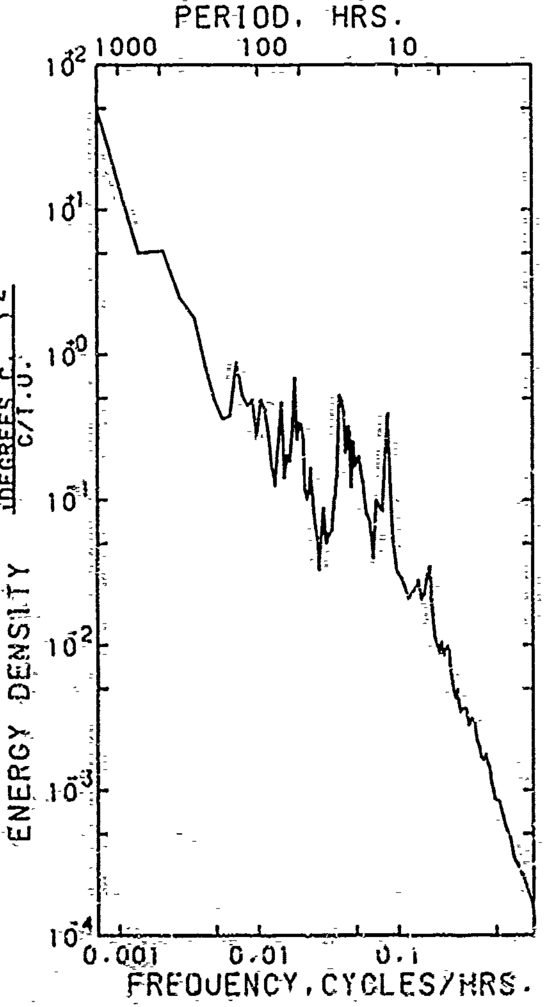
AUTO SPECTRUM
6341$1920 TEMPERATURE
407 METERS
77-XI-18 TO 78-XI-09
2 PIECES WITH 4000 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS



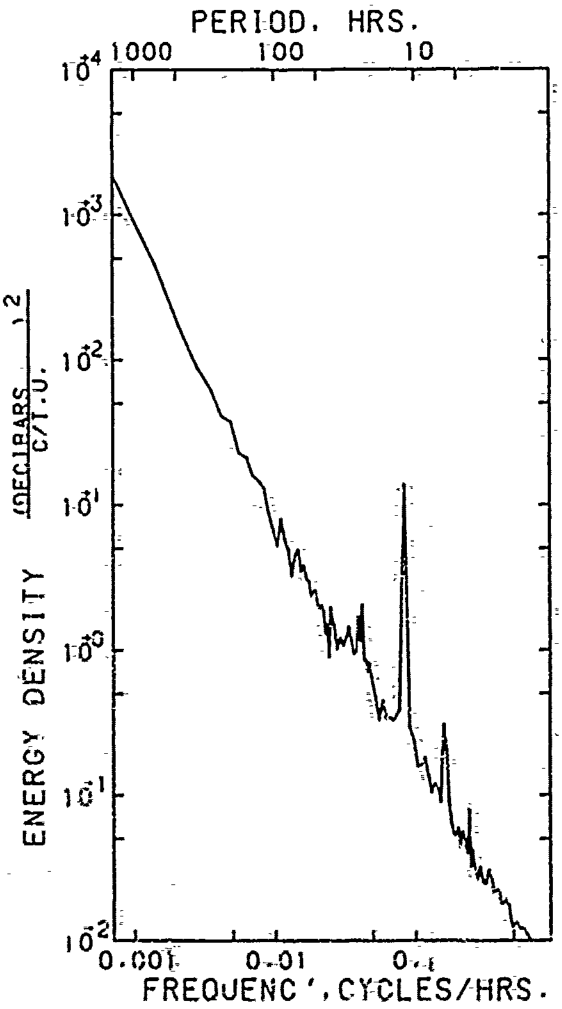
AUTO SPECTRUM
6341$1920 PRESSURE
407 METERS
77-XI-18 TO 78-XI-09
2 PIECES WITH 4000 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS

DATA/ 6351$1920

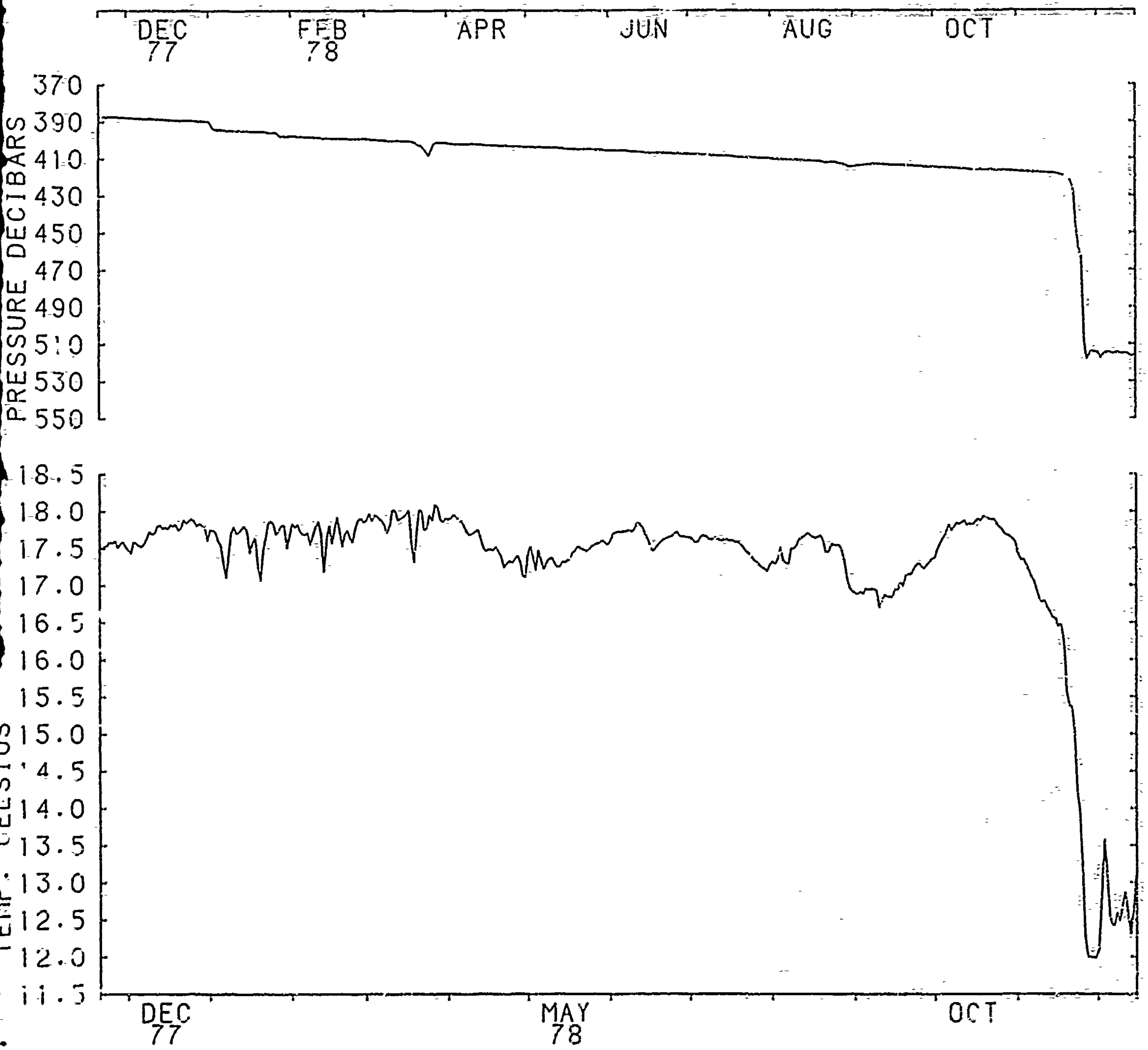
VARIABLE	*	TEMPERATURE	PRESSURE		
UNITS	*	DEGREES C.	DBARS		
MEAN	=	17.163	425.844	*	SAMPLE SIZE = 17700 POINTS
STD. ERR.	=	.767E-2	.755E-1	*	
VARIANCE	=	1.040	100.923	*	SPANNING RANGE
STD. DEV.	=	1.020	10.046	*	FROM 77- XI -18 17.24.00
KURTOSIS	=	12.845	17.920	*	TO 78- XII-17 00.52.00
SKEWNESS	=	-3.120	3.269	*	
MINIMUM	=	11.895	414.929	*	DURATION 393.31 DAYS
MAXIMUM	=	18.271	498.096		



AUTO SPECTRUM
6351$1920 TEMPERATURE
422 METERS
77-XI-18 TO 78-XI-09
2 PIECES WITH 4000 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
6351$1920 PRESSURE
422 METERS
77-XI-18 TO 78-XI-09
2 PIECES WITH 4000 ESTIMATES
PER PIECE. AVERAGED OVER
3 ADJACENT FREQUENCY BANDS



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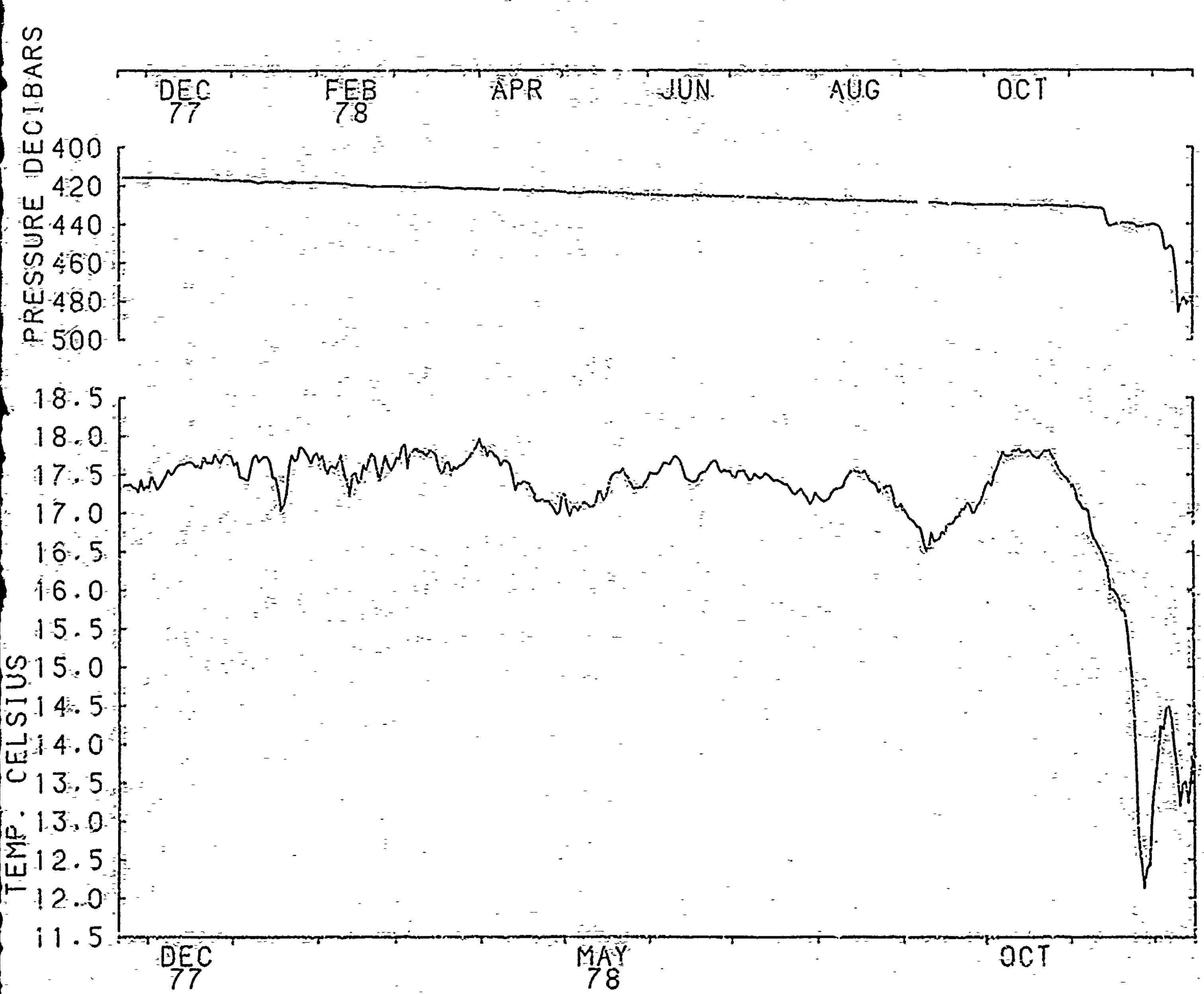

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